3.6 BIOLOGICAL RESOURCES

Information in this section is derived from three key sources: the Biological Resources Technical Report (BTR) focusing on the lagoon (Appendix F), a Jurisdictional Delineation Report or JDR (Appendix G), and a Biological Technical Report addressing disposal and nearshore marine resources (Appendix H). Substantial data has been collected by a wide variety of technical specialists regarding biological resources in the lagoon over the past decade, including monthly bird counts, sensitive species surveys, invertebrate and fish surveys, and vegetation surveys. This information is incorporated into the BTR as well as this section.

This evaluation was drafted to satisfy CEQA and NEPA requirements, as well as support preparation of the 404(b)(1) alternatives analysis and DA permit. Subsequent to CEQA/NEPA approval, and Corps determination of the LEDPA, it is anticipated that USFWS would amend the Biological Opinion for the I-5 North Coast Corridor Project or issue a project specific Biological Opinion through the Section 7 consultation process (USFWS 2012a).

This evaluation is based on findings from previously conducted surveys, plus surveys and research by AECOM and Merkel & Associates biologists. The LA-5 disposal site has been evaluated in an approved EIS (EPA 1987) and material would be placed consistent with EPA-mandated conditions for use. Thus the biological conditions associated with this offshore location and impacts associated with disposing of material into this site have been evaluated. In addition, material proposed for disposal at LA-5 would be required to comply with quality requirements for that site. Preliminary coordination with the Corps and EPA has indicated that the material appears to be suitable for disposal at LA-5. If Alternative 1A is selected for implementation, additional testing (e.g. Tier 3 testing) would be required to obtain final authorization for disposal. Potential biological impacts from disposal at LA-5 are not discussed further.

3.6.1 AFFECTED ENVIRONMENT

The SELRP restoration project is driven by the need to modify the existing lagoon hydrology and prevent further degradation to physical and biological functions of the lagoon (Section 1.2). Restoration would also result in direct changes to the lagoon and to specific sites where excavated materials may be disposed of and/or reused. This section provides separate descriptions of both study areas: the lagoon and the various materials disposal/reuse sites (offshore, nearshore, and onshore). The lagoon study area is referred to as the Biological Study Area (BSA) throughout this section and includes the approximately 960-acre San Elijo Lagoon. The materials disposal/reuse study area discussion addresses beach, and nearshore and offshore areas that may be affected by materials disposal.

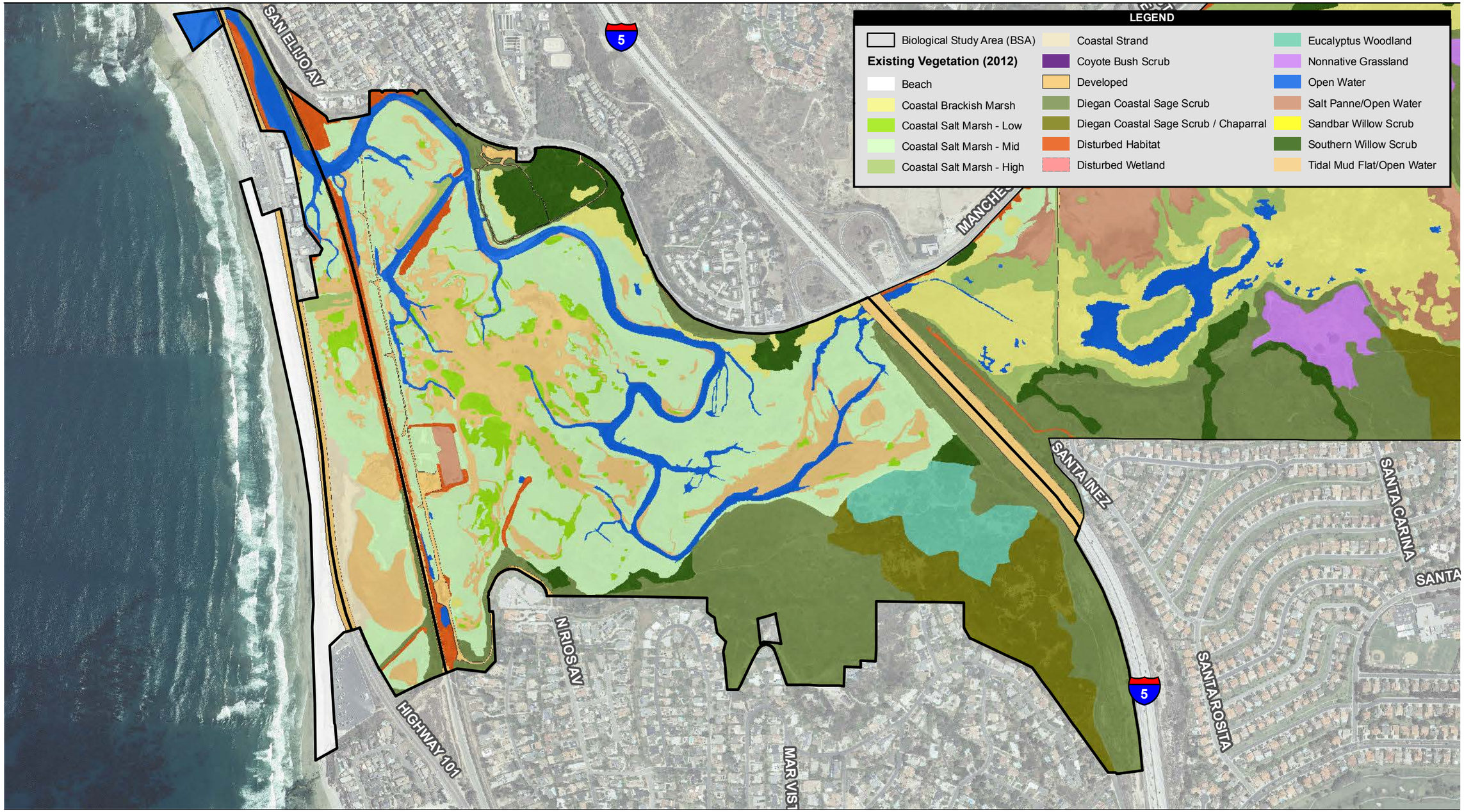
San Elijo Lagoon Biological Study Area

San Elijo Lagoon, as with coastal estuaries, represents a unique ecosystem where marine and terrestrial ecosystems meet. The lagoon currently supports a variety of habitats and a diverse suite of plants and wildlife, including more than 300 species of plants, more than 20 species of fish, more than 20 species of reptiles and amphibians, 24 species of mammals, and more than 295 bird species (including 65 nesting), in addition to a complex suite of terrestrial and marine invertebrates.

San Elijo Lagoon is fed salt water from the Pacific Ocean and freshwater from a 77-square-mile watershed with two main tributaries, Escondido Creek and Orilla Creek. For the estuarine environment to be highly productive, it must be continually replenished with water and nutrients from the ocean. Regular tidal action also provides high water quality, prevents extreme fluctuations in salinity and temperature, and maintains high levels of dissolved oxygen. Due to existing constraints on the lagoon ecosystem that result in regular mouth closures, impounded fresh and salt water, muted tides, and poor circulation, San Elijo Lagoon is functioning in a degraded state.

Vegetation Communities

Vegetation communities are assemblages of plant species that usually coexist in the same area and provide habitat for wildlife species. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Field surveys were performed by AECOM in spring 2010 and 2012. Accordingly, three generalized categories characterize the land cover types observed during vegetation mapping: riparian and other wetlands, uplands, and other cover types. Within these three categories are 10 riparian and wetland communities, six upland communities, and three other cover types (Figures 3.6-1 and 3.6-2). The acreages of each vegetation community and cover type within the BSA are provided in Table 3.6-1. All of the vegetation communities and land cover types identified are considered sensitive, with the exception of developed areas and disturbed habitats, due to their ecological function and ability to support sensitive species. For a complete description of each vegetation community, refer to the BTR in Appendix F.



Source: SANDAG 2012; AECOM 2014

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Scale: 1:9,000; 1 inch = 750 feet

Figure 3.6-1
Vegetation Communities within the BSA - Coastal, West, and Central Basin

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Source: SANDAG 2012; AECOM 2014

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Scale: 1:9,000; 1 inch = 750 feet

Figure 3.6-2
Vegetation Communities within the BSA - East Basin

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Table 3.6-1
Vegetation Communities and Other Cover Types within the Survey Area (Acres)

Vegetation Communities and Other Cover Types[1]	Coastal Area	West Basin	Central Basin	East Basin	Total
Riparian and Wetlands					
Coastal Brackish Marsh			6.1	125.4	131.5
Coastal Salt Marsh – High Littoral Zone		0.8	0.7	118.5	120.0
Coastal Salt Marsh - Mid Littoral Zone		16.7	121.3	3.4	141.4
Coastal Salt Marsh - Low Littoral Zone		1.5	11.8		13.3
Disturbed Wetland[2]				1.1	1.1
Open Water (Tidal Channels & Basin)	1.5	4.3	23.7	10.6	40.1
Salt Panne/Open Water			1.5	35.4	36.9
Sandbar Willow Scrub[2]				9.0	9.0
Southern Willow Scrub[2]			14.4	47.0	61.4
Tidal Mud Flat/Open Water		13.8	49.3		63.1
Subtotal Riparian and Wetlands	***1.5***	***37.1***	***228.8***	***350.4***	***617.8***
Uplands					
Coyote Bush Scrub				7.5	7.5
Diegan Coastal Sage Scrub		3.1	67.0	108.0	178.1
Diegan Coastal Sage Scrub/Chaparral			27.7	21.6	49.3
Eucalyptus Woodland			15.7	3.4	19.1
Nonnative Grassland				33.0	33.0
Subtotal Uplands	***0***	***3.1***	***110.4***	***173.5***	***287.0***
Other Cover Types					
Beach	15.0				15.0
Coastal Strand		5.0			5.0
Developed (Berm Roads)	3.0	5.2	10.4	4.9	23.5
Disturbed Habitat		2.5	6.7	2.6	11.8
Subtotal Other Cover Types	***18.0***	***12.7***	***17.1***	***7.5***	***55.3***
TOTAL	**19.5**	**52.9**	**356.3**	**531.4**	**960.1**

[1] In accordance with the *Draft Vegetation Communities of San Diego County* (Oberbauer et al. 2008), based on the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).
[2] Disturbed Wetland, Sandbar Willow Scrub, and Southern Willow Scrub are combined into a riparian vegetation community when discussing impacts and alternatives.

Designated Habitats

In addition to sensitive habitats, certain habitats receive special designation by USFWS and NMFS. Below is a discussion of specially designated habitats within the survey area.

USFWS Critical Habitat and Primary Constituent Elements

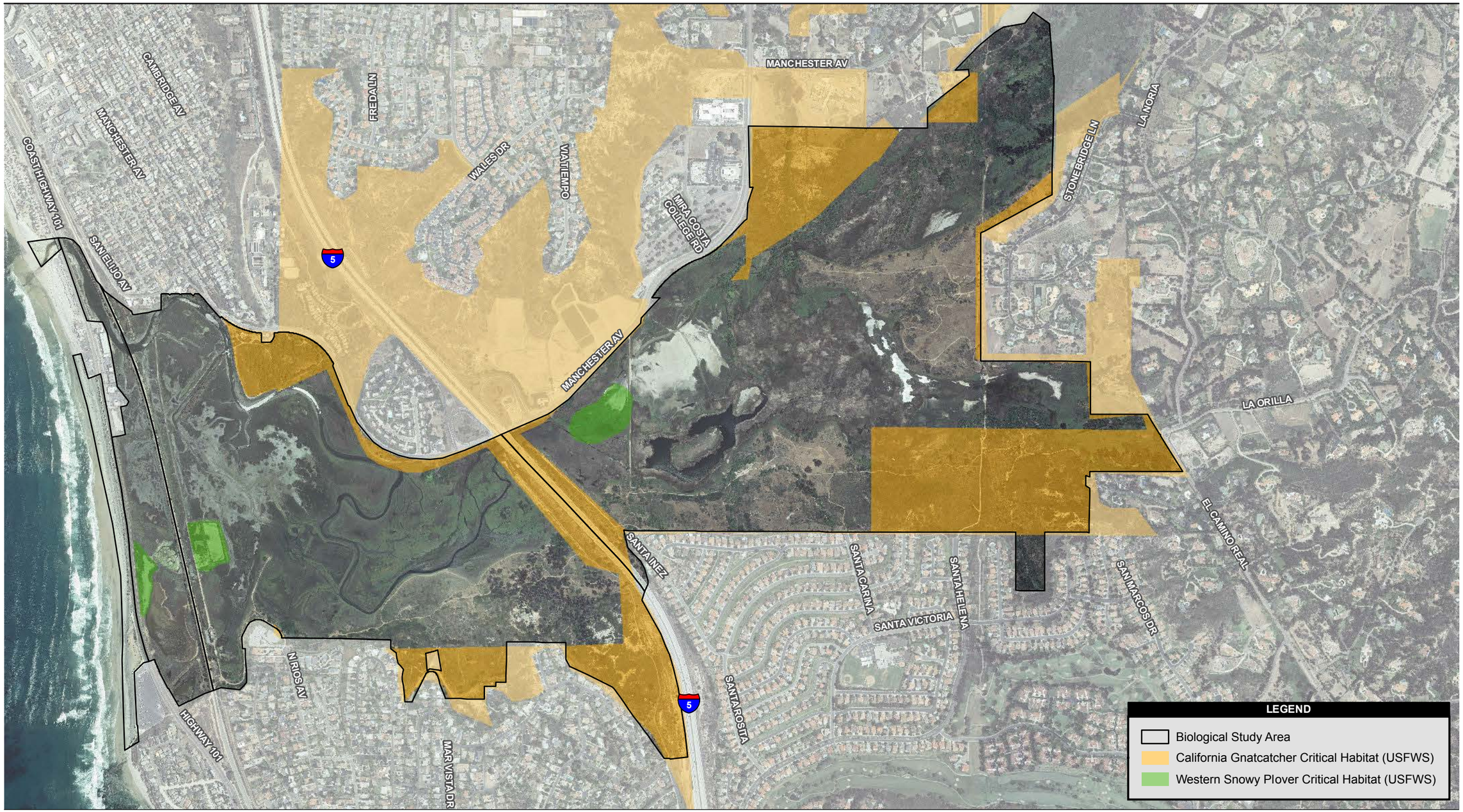
USFWS designates critical habitat for federally threatened and endangered species. It is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. An area is designated as "critical habitat" after USFWS publishes final boundaries of the critical habitat area in the

Federal Register. The areas shown on critical habitat maps are often large, but it is important to note that the entire mapped area may not be considered critical habitat. Only areas that contain the primary constituent elements (PCEs) required by the target species are considered critical habitat. PCEs are the elements of physical or biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. PCEs may include, but are not limited to, (1) space for individual and population growth and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing (or development) of offspring; and (5) habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species (USFWS 2011).

Of the federally listed species known to occur within San Elijo Lagoon, two have critical habitat mapped within the BSA, including the coastal California gnatcatcher and western snowy plover. Coastal California gnatcatcher critical habitat was originally proposed in 2000 and subsequently revised in 2007 by USFWS (72 FR 72009). Approximately 205 acres of coastal California gnatcatcher critical habitat occurs within the BSA, but it is primarily within the coastal sage scrub and chaparral upland habitats surrounding the lagoon (Figure 3.6-3). PCEs for the California gnatcatcher include dynamic and successional sage scrub habitats that provide adequate space for population growth, normal behavior, breeding, reproduction, nesting, dispersal, and foraging. PCEs may also include non-sage scrub habitats (e.g., chaparral, grassland, and riparian areas) in proximity to sage scrub habitats that provide space for dispersal, foraging, and nesting.

Western snowy plover critical habitat was originally proposed in 1995 but was not finalized until 1999 (USFWS 1999). It was subsequently revised as part of the final rule in 2005 (USFWS 2005). In 2012, the critical habitat was once again updated and, at that time, approximately 15 acres was identified within San Elijo Lagoon and the BSA. The new designation of critical habitat within San Elijo Lagoon is a direct result of the SELRP restoration planning effort, and the identified critical habitat subunits for western snowy plover correspond to the potenential future nesting sites identified in the restoration alternatives.

The citical habitat within the lagoon was divided into three potential nest sites or subunits, labeled CA 51A, CA 51B, and CA 51C (USFWS 2012b) (Figure 3.6-3). PCEs for western snowy plover currently exist on-site within these subunits, and include sandy beaches and tidally influenced estuarine mud flats (PCE 2) with tide-cast organic debris supporting small invertebrates (PCE 3). Although not discretely mapped by USFWS, the following four PCEs have the potential to occur within each of the three subunits, either individually or together:



Source: SANDAG 2012; USFWS; AECOM 2014

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Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-3
Critical Habitat for California Gnatcatcher and Western Snowy Plover

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- PCE 1 – Areas that are below heavily vegetated areas/developed areas and above the daily high tides
- PCE 2 – Shoreline habitat areas for feeding with no or very sparse vegetation that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation but not constantly under water, that support small invertebrates that are essential food sources such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods
- PCE 3 – Surf- or water-deposited organic debris such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in PCE 2, provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults
- PCE 4 – Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators and provide relatively undisturbed areas for individual and population growth and for normal behavior

At this time, these three subunits and PCEs associated with western snowy plover are in a degraded state and have not supported nesting plover for the last decade. As noted in the Federal Register, restoration of degraded habitat within these three subunits will improve the habitat (USFWS 2012b).

No critical habitat for other federally listed species occurs within the BSA.

Essential Fish Habitat

As described in the Regulatory Section in Section 1.5 and Appendix C, EFH is defined as those "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The coastal waters of southern California are designated as EFH, which are managed by NMFS. Estuaries are considered a Habitat Area of Particular Concern (HAPC), which is a subset of EFH. Estuaries (as mapped by NOAA) are considered an important habitat in the lifecycle of many fish as they often support the early larval and juvenile stages of development when adequate habitat structure is present. San Elijo Lagoon is mapped as EFH both for groundfish and as estuarine HAPC. As San Elijo Lagoon does not support substantial subtidal habitat, it is likely that the lagoon is currently not playing a critical role in sustaining nearshore fish populations. However, the connection of the protected open water and tidal channels in the lagoon to the open ocean may still play some role in supporting local fish populations.

When the lagoon mouth is open, the project area is likely suitable for four species of finfish, Pacific sardine, Pacific (chub) mackerel, northern anchovy, and jack mackerel; and market squid. Juvenile sardine and anchovy may venture into or be transported to the project area with tidal waters. Highly migratory species, such as tuna, swordfish, and sharks, are not expected to occur in the project area. Local populations of leopard shark and rays may be present as mudflats provide potentially suitable foraging habitat for these bottom feeding species.

Jurisdictional Waters and Wetlands

As described in detail in Appendix G, a jurisdictional delineation (including verified Preliminary Jurisdictional Determination form) was completed for the BSA in 2010. A total of 620.0 acres of potential jurisdictional waters and wetlands occurs within the BSA (Figure 3.6-4). Of these acres, 618.0 acres is considered potential waters of the U.S. and state. An additional 1.9 acres is considered potential waters of the state only.

Total jurisdictional waters of the U.S. and state are listed for each wetland habitat and other waters of the U.S. (in the form of wetlands, tidal waters, or nonwetland waters/ordinary high water mark) in Table 3.6-2. Vegetation is classified by habitat type using both the San Diego Regional Holland Code Classification System and *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). A summary of the jurisdictional waters of the U.S. and state, with the corresponding regulatory authority, occurring within the survey area, is provided in Table 3.6-3.

Table 3.6-2
Potential Waters of the U.S. and State Occurring within the BSA

Type of Jurisdictional Waters of the U.S. and State	Type of Habitat (Holland et al. 1986, 1996, 2006, 2008)[1]	Type of Habitat (Cowardin et al. 1979)	Area of Aquatic Resource (acres)
Jurisdictional Waters of the U.S.			
Wetland	Southern Coastal Brackish Marsh (52200)	Estuarine; Intertidal; Emergent, Persistent, Regularly Flooded, Mesosaline	131.4
Wetland	Southern Coastal Salt Marsh (52120)	Estuarine; Intertidal; Emergent, Persistent, Regularly Flooded, Mixohaline	262.1[2]
Wetland	Disturbed Wetland (11200)	Palustrine; Scrub/Shrub Broad-leaved, Deciduous, Seasonally Flooded, Fresh	1.2
Wetland	Sandbar Willow Scrub (63000)	Palustrine; Scrub/Shrub Broad-leaved, Deciduous, Seasonally Flooded, Fresh	8.9

Type of Jurisdictional Waters of the U.S. and State	Type of Habitat (Holland et al. 1986, 1996, 2006, 2008)[1]	Type of Habitat (Cowardin et al. 1979)	Area of Aquatic Resource (acres)
Wetland	Southern Willow Scrub (63320)	Palustrine; Scrub/Shrub Broad-leaved, Deciduous, Seasonally Flooded, Fresh	61.0
Other Waters	Drainage Features/ Nonvegetated Channel (64200)	Riverine; Unconsolidated Bottom, Sand, Intermittently Flooded, Fresh	0.6 (3,640 linear feet)
Tidal Waters	Open Water/Subtidal Estuary (64131)	Estuarine; Subtidal; Unconsolidated Bottom, Mud, Mixohaline	40.2
Other Waters	Open Water/Salt Panne (64300)	Palustrine; Unconsolidated Bottom; Mud, Temporarily Flooded Saturated, Hyperhaline	37.0
Tidal Waters	Open Water/Tidal Mudflat (64200)	Estuarine; Subtidal; Unconsolidated Bottom, Mud, Regularly Flooded, Mixohaline	75.8
Subtotal Jurisdictional Waters of the U.S.			*618.2*
Jurisdictional Waters of the State			
Riprap Banks (Tidal Inlet Banks)	Disturbed Wetland (11200)	Riverine; Tidal; Artificial Substrate Irregularly Exposed, Mixohaline	1.9
Subtotal Jurisdictional Waters of the State			*1.9*
Grand Total Jurisdictional Waters			**620.1**

[1] The *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) does not provide classifications for abiotic features. These habitat codes are in accordance with the *Draft Vegetation Communities of San Diego County* (Oberbauer et al. 2008), based on the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Disturbed habitats are included as jurisdictional aquatic features.

[2] The 262.1 acres of southern coastal saltmarsh is composed of three components or saltmarsh zones: low coastal saltmarsh (4.7 acres), middle coastal saltmarsh (137.4 acres), and high coastal saltmarsh (120.0 acres).

Table 3.6-3
Summary of Jurisdictional Waters of the U.S. and State Occurring within the BSA

Type of Jurisdictional Waters of the U.S. and State	Regulatory Authority	Area (acres)
Jurisdictional Waters of the U.S.[1]		
Other Waters	CCC, CDFW, RWQCB, and Corps	37.6
Tidal Waters	CCC, CDFW, RWQCB, and Corps	116.0
Wetland	CCC. CDFW, RWQCB, and Corps	464.6
Subtotal Jurisdictional Waters of the U.S.		*618.2*
Jurisdictional Waters of the State		
Tidal Inlet Bank	CCC, CDFW, and RWQCB	1.9
Subtotal Jurisdictional Waters of the State Only		*1.9*
Grand Total Jurisdictional Waters		**620.1**

[1] Jurisdictional waters of the U.S. include jurisdictional waters of the state and are under the purview of the Corps, RWQCB, and CDFW. Of the 618.2 acres of waters of the U.S., approximately 71.7 acres are non-RHA Section 10 waters (e.g., nontidal waters) and are regulated, at the federal level, under Section 404 of the CWA. Therefore, the remaining 546.5 acres of waters of the U.S. are regulated under both Section 10 and Section 404. See the Appendix G, Attachment B (Preliminary JD Form) for the location and area of each non-RHA Section 10 water of the U.S.

Rare, Threatened, or Endangered Species

This section summarizes the sensitive flora (plants) and fauna (animals) known to occur, or with the potential to occur, within the BSA.

Flora

The BSA is biologically diverse with over 300 species of plants. As described in the BTR, 32 sensitive plant species were determined to have some potential to occur in the BSA based on habitat conditions and regional location. Of these, 22 sensitive plant species were detected within the BSA during the 2010 botanical surveys. These 22 sensitive plant species and their locations are mapped in Figure 3.6-5 and identified below, organized by federally listed, state-listed, and nonlisted plant species. There is one federally listed plant species and one state-listed plant species; the remaining 20 are special-status, but not listed. Although discussed further in the BTR and impact section, it is important to note that no federally listed or state-listed rare, threatened, or endangered plant species occur within the areas proposed for restoration.

Federally Listed Plant Species

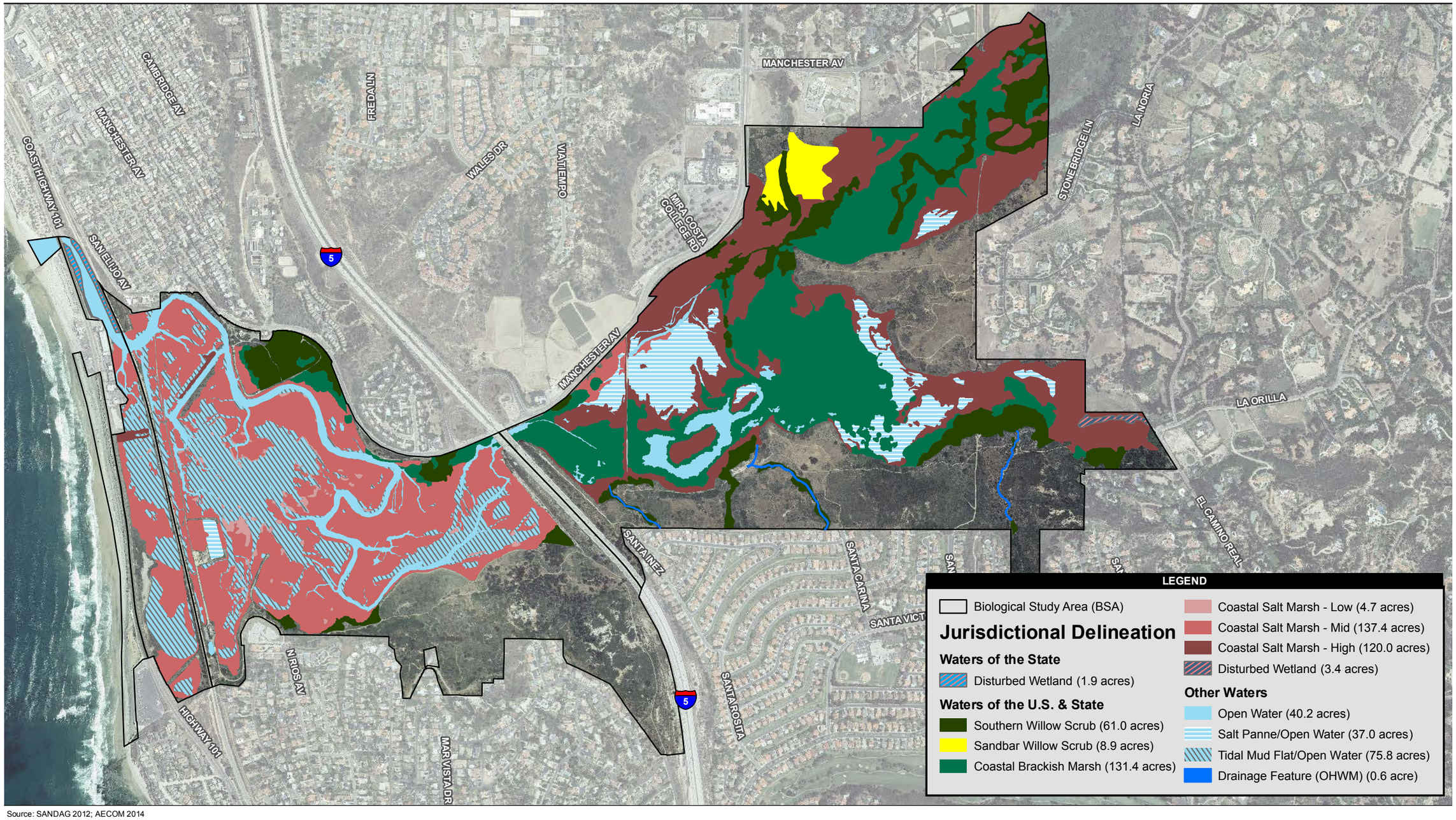
Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *Crassifolia*) was the only federally listed plant species found present within the BSA. Within San Diego County, this evergreen shrub is only found from Torrey Pines State Reserve north to Encinitas. Del Mar manzanita occurs in chaparral, often with chamise and wart-stemmed ceanothus (*Ceanothus verrucosus*) on eroding sandstone. Del Mar manzanita is found in the Diegan coastal sage scrub/chaparral community in the southern central portion of the BSA, just west of I-5.

State-listed Plant Species

Orcutt's goldenbush (*Hazardia orcuttii*) was the only state-listed plant species found present within the BSA. Orcutt's goldenbush is found from San Diego County south to Baja California, Mexico. Open chaparral with chamise and Diegan coastal sage scrub is the preferred habitat of this species (Reiser 2001). Approximately 25 Orcutt's goldenbush individuals are found in nonnative grassland Diegan coastal sage scrub in the eastern portion of the BSA.

Nonlisted Special-Status Plant Species

Special-status plant species are considered sensitive by the California Native Plant Society (CNPS) in Lists 1, 2, 3, or 4 (Appendix F). Of the 28 nonlisted sensitive plant species considered possible, 20 were found present within the BSA as shown in Figure 3.6-5. Nonlisted sensitive



Source: SANDAG 2012; AECOM 2014

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Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-4
Jurisdictional Waters in BSA

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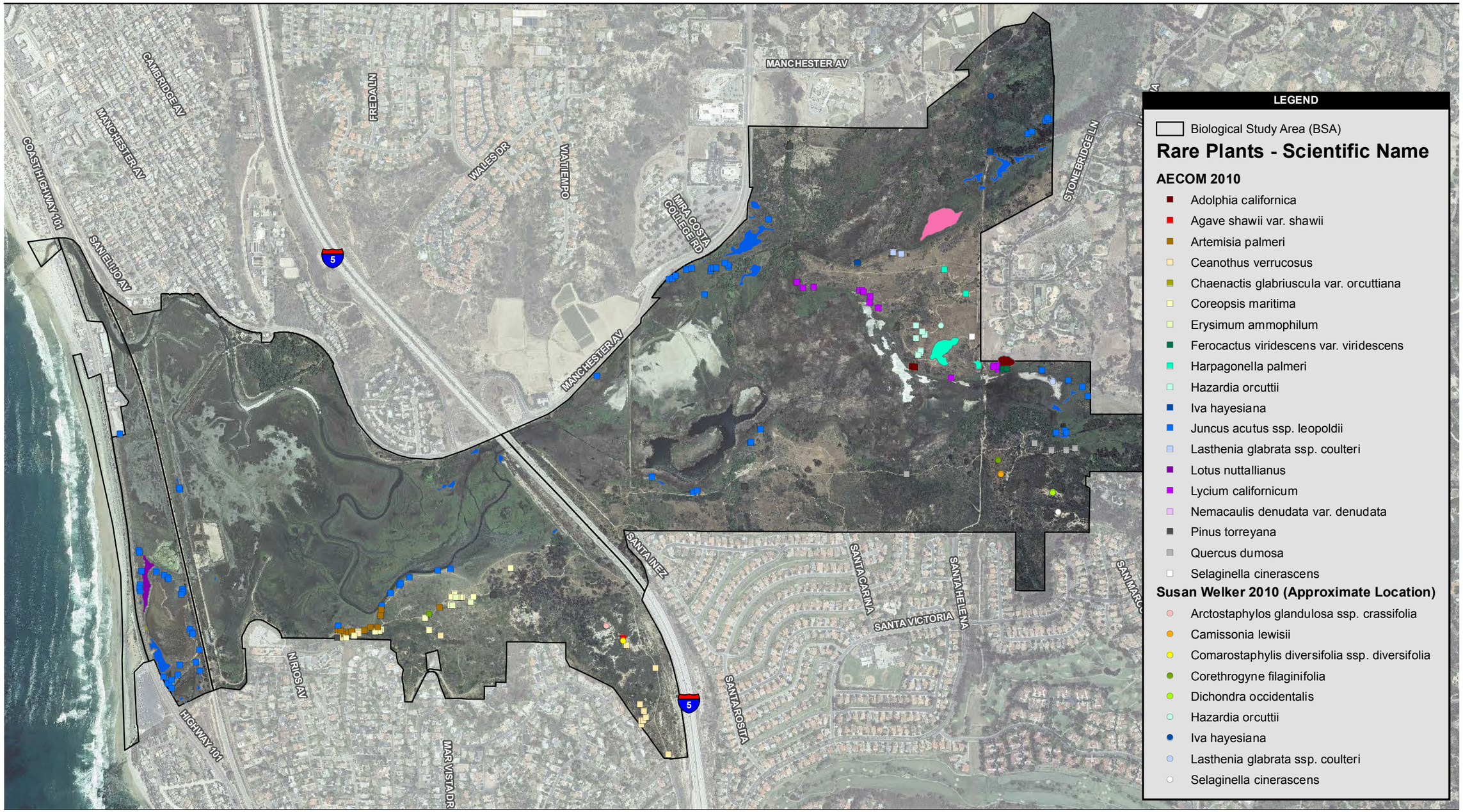

Source: SANDAG 2012; AECOM 2014

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Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-5
Rare Plants within the BSA

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plant species detected on-site include spineshrub (*Adolphia californica*), San Diego sagewort (*Artemisia palmeri*), Lewis's evening-primrose (*Camissonia lewisii*), wart-stemmed ceanothus (*Ceanothus verrucosus*), Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*), summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*), sea dahlia (*Coreopsis maritima*), western dichondra (*Dichondra occidentalis*), coast wallflower (*Erysimum ammophilum*), coast barrel cactus (*Ferocactus viridescens* var. *viridescens*), Palmer's grapplinghook (*Harpagonella palmeri*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), Coulter's goldfields (*Lasthenia glabrata* ssp. *Coulteri*), Nuttall's lotus (*Lotus nuttallianus*), California desert thorn (*Lycium californicum*), coast woolly-heads (*Nemacaulis denudata* var. *denudate*), Torrey pine (*Pinus torreyana* var. *torreyana*), Nuttall's scrub oak (*Quercus dumosa*), and mesa spike-moss (*Selaginella cinerascens*).

For detailed population information for nonlisted plant species, refer to the BTR (Appendix F).

Fauna

The BSA is biologically rich with over 20 species of fish, over 20 species of reptiles and amphibians, 24 species of mammals, and over 295 bird species (including 65 nesting), in addition to a complex suite of terrestrial and marine invertebrates. As discussed in the BTR, 94 special-status wildlife species have potential to occur within the BSA (CDFG 2011; BioBlitz 2009; Patton 2010; SELC 2011; MEC 2002). Of these 94 special-status species, seven federally listed and/or state-listed species and 13 rare nonlisted species were detected during studies and are considered resident/breeding within the BSA. Location data that were available for special-status wildlife species detected in the BSA are shown in Figures 3.6-6 through 3.6-8. Detailed discussions of federally and state-listed special-status wildlife species detected during studies and considered resident/breeding within the BSA are provided below. Nonlisted special-status species with potential to occur, but considered migrants/nonbreeding season residents (no suitable breeding habitat is present on-site), are discussed only in Appendix F.

Federally Listed Species

The following six species listed as federally threatened or endangered were detected on-site during previous studies and are considered resident/breeding within the BSA:

- light-footed clapper rail (*Rallus longirostris levipes*)
- western snowy plover (*Charadrius alexandrinus nivosus*)
- California least tern (*Sternula antillarum browni*)
- southwestern willow flycatcher (*Empidonax traillii extimus*)
- least Bell's vireo (*Vireo bellii pusillus*)
- coastal California gnatcatcher (*Polioptila californica californica*)

Detailed information on the life history of these species is provided in Appendix F; a brief description of each species and their occurrence within the BSA is provided below.

LIGHT-FOOTED CLAPPER RAIL

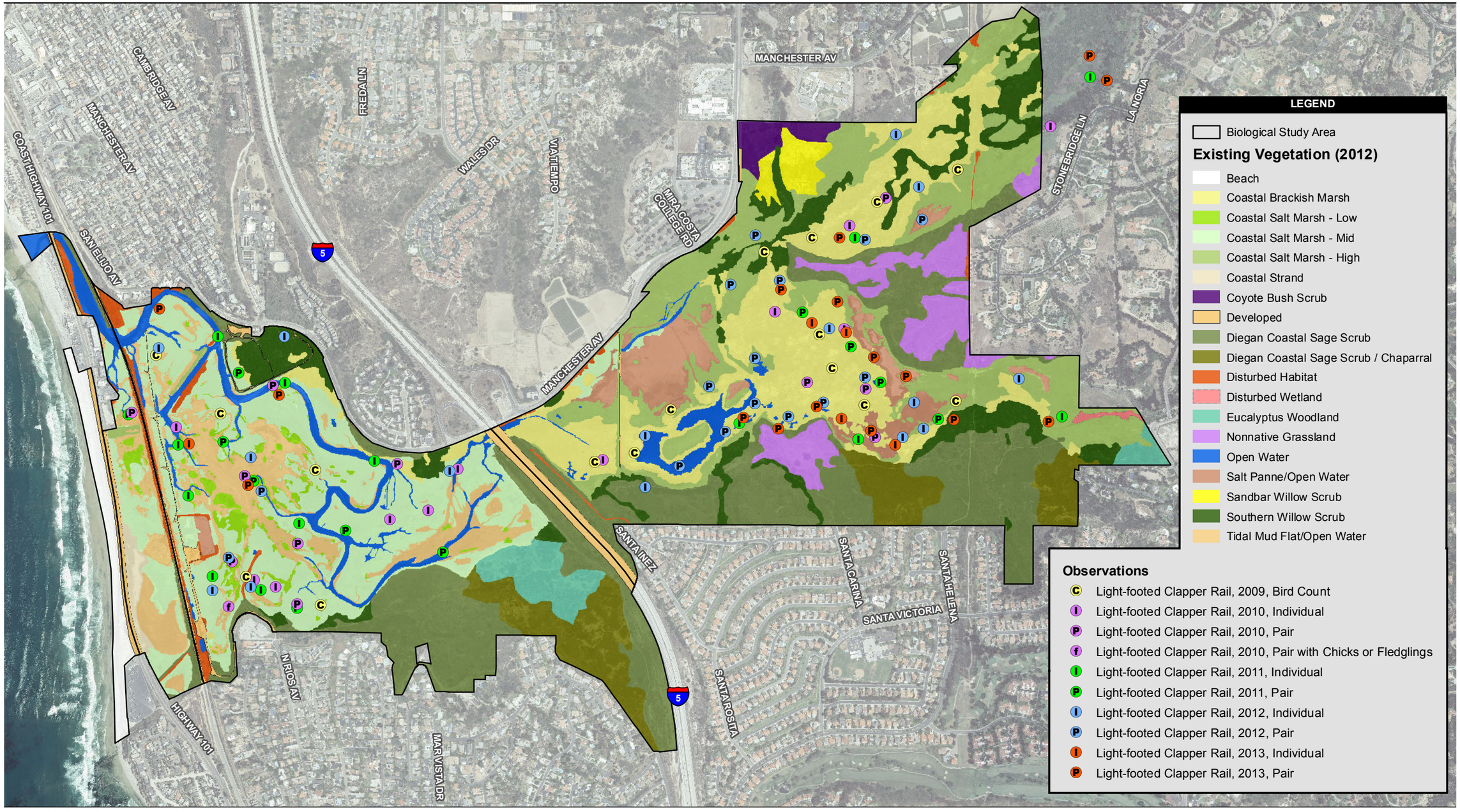
The light-footed clapper rail is federally and state-listed as endangered. The species is restricted to coastal salt marshes in Southern California where vegetation is dominated by cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* sp.). It can also be found in brackish and freshwater marshes with cattails and bulrushes. Light-footed clapper rail is a reclusive species and will nest and utilize relatively small patches of its preferred habitat when isolated from external anthropogenic disturbances (Zembal and Hoffman 2012).

Within the BSA, the light-footed clapper rail is a year-round resident at San Elijo Lagoon and can be heard calling in the evening, although it is rarely seen. Total number of breeding pairs in the lagoon has ranged from six to 31 over the past 5 years, with 15 breeding pairs recorded both in 2010 and 2011 (Zembal et al. 2011), 31 pairs detected in 2012, and 20 pairs recorded in 2013 (Zembal et. al 2013). Breeding territories are usually focused in brackish marsh adjacent to saltmarsh, flats, and channels in the central basin north of the end of North Rios Avenue and adjacent to the Nature Center, and in the east basin between the CDFW dike and I-5, east of the south end of the dike, north of Santa Carina Street, and along Escondido Creek west of the power lines. In 2013, two pairs were detected in the west and central basins, and the remaining 18 pairs were detected in the eastern basin within the brackish marsh. Further counts detected light-footed clapper rail in 16 locations throughout the BSA (Figure 3.6-6).

WESTERN SNOWY PLOVER

The western snowy plover is listed as federally threatened and a species of special concern by the state. Western snowy plover occurs along the Pacific coast from southern Washington to Baja California. It is a common winter migrant, winter visitor, and a declining and local resident in San Diego County. It nests on undisturbed, flat areas with loose substrate, such as sandy beaches and dried mudflats along the California coast. Western snowy plovers forage primarily on the wet sand at the beach-surf interface, where they feed on small crustaceans, marine worms, insects, and amphipods.

Within the BSA, western snowy plovers are regularly spotted foraging within mudflats. Up to 76 western snowy plover individuals were recorded within the lagoon and adjacent beach area on September 29, 2011 (Patton 2012a). Historically, plovers were recorded nesting within the BSA on the east basin islands and east basin dike. Postbreeding and wintering roosting flocks have been documented at Cardiff State Beach, which is adjacent to the BSA. Roost sites have varied



Source: SANDAG 2012; Zembal 2011, 2012; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-6
Light-footed Clapper Rail Observations

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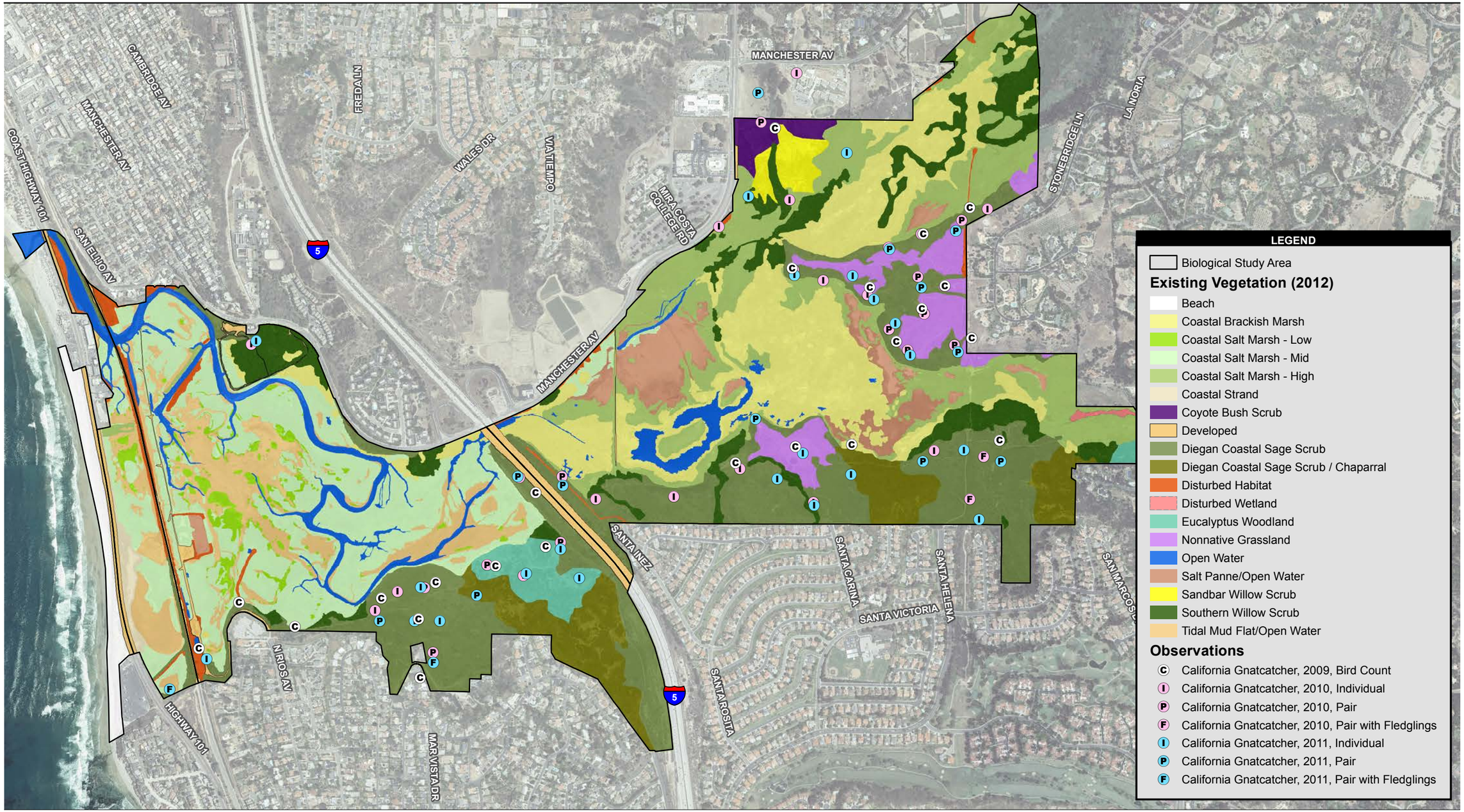

Source: SANDAG 2012; Patton 2010, 2012; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-7
California Gnatcatcher Observations

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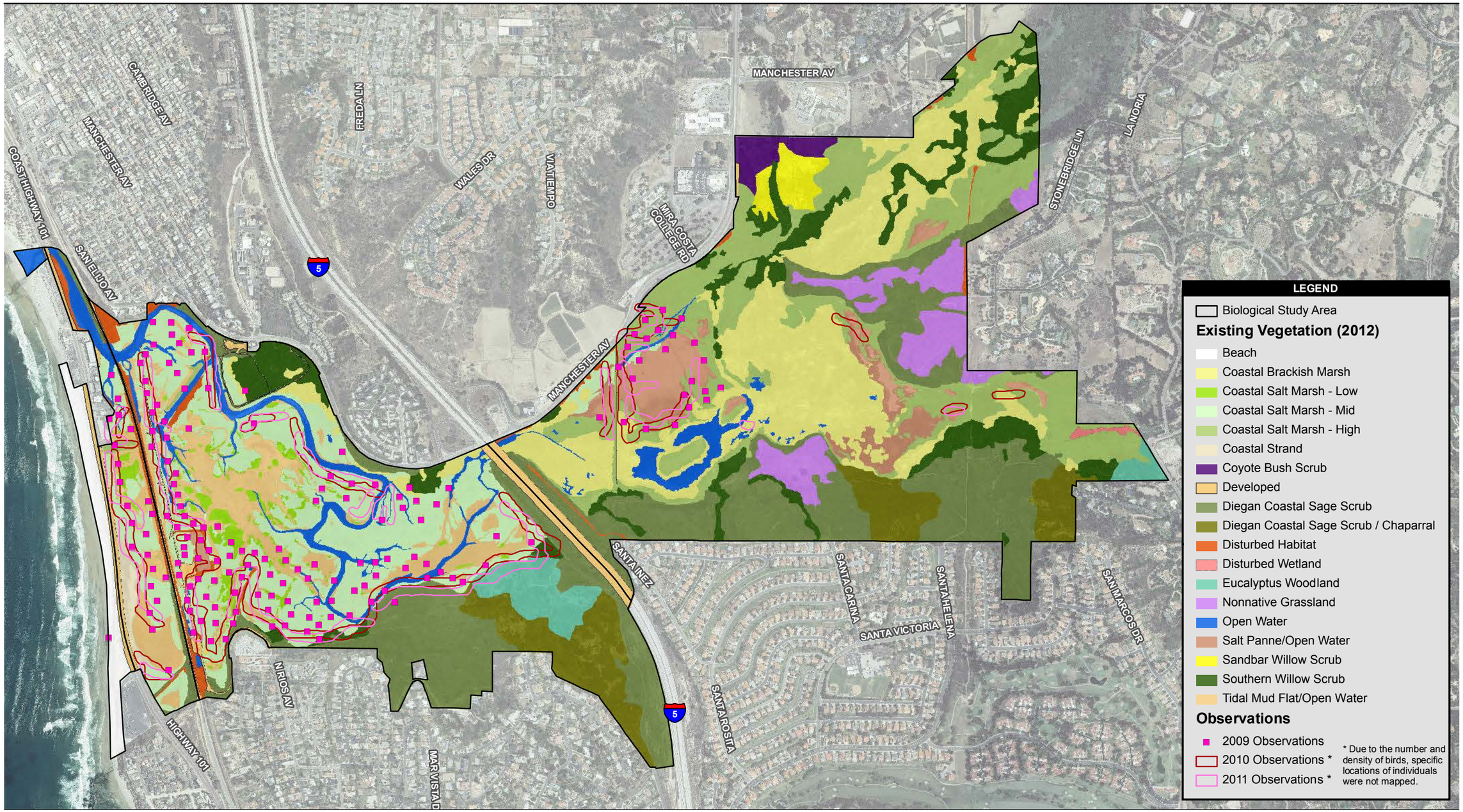

Source: SANDAG 2012; Patton 2010, 2011, 2012; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-8
Belding's Savannah Sparrow Observations

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but have included both sides of the mouth of the lagoon. No breeding has been recorded within the lagoon since 2002 (Patton 2010).

California Least Tern

The California least tern is federally and state-listed as endangered. The species breeds from San Francisco Bay south to Baja California. In San Diego County, it is a fairly common summer resident from early April to the end of September (Unitt 2004). Wintering areas are thought to be along the Pacific coast of South America. The species historically nested colonially on beaches that are undisturbed, sparsely vegetated, flat areas with loose, sandy substrate. Few beach nesting areas remain and least terns are now found in varied habitats ranging from mudflats to airports. Adults roost primarily on the ground. They typically forage in areas with water less than 60 feet in depth and within 2 miles of roosting sites although they are considered opportunistic often shifting their behavior in response to local prey patterns (Atwood and Minsky 1983). The species nests in loose colonies in areas relatively free of human or predatory disturbance. Nests are on barren to sparsely vegetated sites near water, usually with a sandy or gravelly substrate.

Within the BSA, the least tern is a common migrant and has been observed foraging. Records indicate that this species historically had a breeding population within the BSA. They have nested in colonies on salt panne, patches of sand on alluvial fans and channel edges, and on the two islands in the east basin north of Santa Carina Street that were constructed by CDFW and County Department of Public Works in 1981. Changes in inundation patterns and habitat quality may have had a negative effect on breeding success within the BSA. No breeding has been documented since 2002 (Patton 2010).

Least terns were observed in very limited numbers and only relatively late in the season in 2011. Two to three were reported on June 12 and five to seven on July 11 foraging throughout the lagoon and nearshore waters and roosting on mudflats in the lagoon. One fledgling was observed along the beach on July 22 and two adults on August 8. No nests were documented in 2011 and no on-ground tern activity was observed on the salt panne east of the east basin dike or in other potential nesting areas (Wolf 2011).

Southwestern Willow Flycatcher

The southwestern willow flycatcher, a subspecies of willow flycatcher (*Empidonax trailli*), is a federally endangered species (USFWS 1995). The southwestern willow flycatcher was federally listed as endangered in 1995 and state listed as endangered in 1990.

The southwestern willow flycatcher is a summer breeding resident in riparian habitats in southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and northwestern Mexico (USFWS 1995). In San Diego County, only two breeding populations are known to remain along the Santa Margarita River and the upper San Luis Rey River. The southwestern willow flycatcher is restricted to dense riparian woodlands of willow, cottonwood, and other deciduous shrubs and trees. In general, the riparian habitat of this species tends to be rare, isolated, small, and/or in linear patches, separated by vast expanses of arid lands.

Within the BSA, this species was observed in the riparian habitat near the Nature Center in the northwestern central basin in May and June of 2002, two in the same area on May 30, 2004, and one individual on June 3, 2007. An individual was also observed along a trail west of El Camino Real on June 11, 2007 (Patton 2010) and one individual was reported along the La Orilla Trail west of El Camino Real on May 15, 2010 (Patton 2012b).

LEAST BELL'S VIREO

The least Bell's vireo was federally listed as endangered in 1986 and state listed as endangered in 1980. Least Bell's vireo breeding season extends from March through September. During the breeding season, the least Bell's vireo is restricted to riparian woodland and riparian scrub. In San Diego County, it occurs mainly in the coastal lowlands, rarely up to 3,000 feet elevation. Territory size ranges from 0.5 to 7.5 acres and there is evidence of high site fidelity among adults (Kus 2002). Early to midsuccessional riparian habitat is typically used for nesting by this vireo because it supports the dense shrub cover required for nest concealment as well as a structurally diverse canopy for foraging (Kus 2002).

Within the BSA, this species has been recorded within southern willow scrub habitat. Observations of this species within willow scrub near the Nature Center were documented in 2007 (Patton 2010). In addition, breeding pairs were detected upstream of the La Bajada bridge in 2009 (Bache 2009). In 2011, breeding pairs were recorded adjacent to Escondido Creek and Lux Canyon Drainage (Patton 2012b).

COASTAL CALIFORNIA GNATCATCHER

The coastal California gnatcatcher was listed as federally threatened in 1993 and is a state species of special concern. Habitat preferences in San Diego County consist of Diegan coastal sage scrub dominated by California sagebrush and flat-topped buckwheat, which are the primary plants used by coastal California gnatcatchers when foraging for insects (RECON 1987; ERCE 1990). The species inhabits coastal sage scrub vegetation below 2,500 feet elevation in Riverside

County and generally below 1,000 feet elevation along the coastal slope in San Diego County; it generally avoids steep slopes above 25 percent and dense, tall vegetation for nesting.

Within the BSA, the coastal California gnatcatcher is known to occur within the coastal sage scrub located on the slopes of the BSA. In 2009, gnatcatchers were recorded from 23 locations from within the BSA (Patton 2010). In 2010, gnatcatchers were recorded from 35 locations in the central and east basins (Patton 2012b). In 2011, gnatcatchers were recorded from 35 locations within the BSA (Patton 2012b) (Figure 3.6-7).

State-Listed Species

Of the 94 special-status species with potential to occur within the BSA, five species were listed as state threatened or endangered, were detected during previous studies, and are considered resident/breeding within the BSA: California least tern, least Bell's vireo, light-footed clapper rail, southwestern willow flycatcher, and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*). The California least tern, least Bell's vireo, light-footed clapper rail, and southwestern willow flycatcher are also federally listed and were discussed above. The Belding's savannah sparrow is discussed in detail below.

BELDING'S SAVANNAH SPARROW

Belding's savannah sparrow is a state-listed endangered species. Belding's savannah sparrow is a resident from Santa Barbara County to northern Baja California. In San Diego County, populations are known from the Tijuana estuary, San Diego Bay, Mission Bay, San Dieguito Lagoon, Peñasquitos Lagoon, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Santa Margarita River mouth, and Aliso Creek mouth (Unitt 2004). Its preferred habitat is the edge of pickleweed-dominated coastal salt marsh associations. Breeding occurs mostly in dense, moist grasslands, wet meadows, and salicornia wetlands, with or without scattered shrubs or clumps of tall herbs. In winter, the species occupies moist and dry grasslands but prefers dense, short ground cover. It also occurs in low vegetation in croplands and along beaches and shorelines.

Within the BSA, the Belding's savannah sparrow is a common resident within the pickleweed marsh. Surveys were conducted within the lagoon from 1973 through 2009. Surveys in 2009 by Robert Patton documented observations of the sparrow within the lagoon with mapped locations and annotations of the behavior including but not limited to pairing, singing, posting/perching, chasing, foraging, and flying. Pairs included those observed nest building and feeding young. Surveys in 2009 indicated that 136 pairs occurred within the BSA (Patton 2010). No species-specific surveys were conducted for Belding's savannah sparrow during 2010 and 2011. During

monthly bird counts during 2010 and 2011, this species was observed in several locations in all three basins (Patton 2012b) (Figure 3.6-8).

Nonlisted Special-Status Wildlife Species

In addition to the federally and state-listed species discussed above, 13 nonlisted special-status wildlife species were detected during previous studies and are considered resident/breeding within the BSA. These are wandering (salt marsh) skipper (*Panoquina errans*), orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), silvery legless lizard (*Anniella pulchra pulchra*), Cooper's hawk (*Accipiter cooperi*), northern harrier (*Circus cyaneus*), osprey (*Pandion haliaetus*), western bluebird (*Sialia Mexicana*), white-tailed kite (*Elanus leucurus majuscules*), yellow warbler (*Dendroica petechia brewsteri*), yellow-breasted chat (*Icteria virens*), California (western) mastiff bat (*Eumops perotis californicus*), western red bat (*Lasiurus blossevillii*), and southern mule deer (*Odocoileus hemionus fulginata*).

Nonlisted special-status species with potential to occur in the BSA, but not detected during historic surveys, and those nonlisted special-status species detected in the BSA, but where the BSA does not contain suitable breeding habitat, are described in Appendix F and are not addressed further in this EIR/EIS.

Wildlife Corridors/Connectivity

Corridors are linear landscape features that allow for species movement over time between two patches of habitat or patches of vital resources that would otherwise be disconnected (Beier and Noss 1998; Lidicker and Peterson 1999; Beier et al. 2008). Connectivity, or the ability of organisms to move through a landscape, is essential in heterogeneous landscapes, especially in increasingly urban settings, for the persistence of healthy and genetically diverse animal communities. Corridors can facilitate connectivity on different temporal and spatial scales. Because many wildlife species have species-specific habitat requirements for survival and dispersal, corridors may also be species specific. At a minimum, corridors promote local colonization or recolonization of distinct habitat patches and potentially increase genetic variability within and between populations. Thus, corridors help species populations, distributed in and among habitat patches, to persist over time.

Local corridors allow resident animals to access critical resources (food, water, and cover) in other areas that might otherwise be isolated. A wildlife movement study was not conducted within the project area; however, the area is important to local wildlife movement. In general, wildlife species are likely to use habitat within the project area for movements related to home

range activities (foraging for food or water; defending territories; searching for mates, breeding areas, or cover).

Regional corridors link two or more large areas of natural open space. San Elijo Lagoon is not functioning as a regional corridor. Instead, it is a large area of natural open space connected to Escondido Creek. Escondido Creek links San Elijo Lagoon with other open space habitat in Harmony Grove and the Elfin Forest to the northeast. San Elijo Lagoon is important in that it provides a large area of habitat for core populations of sensitive wildlife and plant species.

Materials Disposal/Reuse Study Area

The proposed project and its alternatives would generate a substantial amount of material for disposal, possibly through export to upland or offshore disposal or stockpiling sites, reuse for construction of infrastructure, or reuse for beach/nearshore nourishment.

The majority of the placement sites, with the exception of LA-5, were analyzed as receiver sites under the EIR/EA for the 2012 RBSP (SANDAG 2011); therefore, the biological conditions described for the 2012 RBSP have been considered (and updated as appropriate) in the Marine Biological Technical Report (Appendix H) for these sites and are summarized below. LA-5 was analyzed in the EIS for LA-5 (EPA 1987); therefore, the biological conditions described in the EIS for LA-5 are summarized below. Each of the seven proposed placement sites is described in terms of habitat and species identified within its boundaries (i.e., footprint) as well as nearby sensitive resources. Sensitive resources are defined at the habitat level to include vegetated nearshore reefs and kelp beds, and at the species level to include threatened or endangered species. Potential suitability of placement sites as spawning habitat for California grunion is noted in the text. Generally, sandy beaches with gentle slopes and sufficient beach width above the mean high tide line to support egg incubation would be suitable, while beaches with substantial cobble, steep slopes, or with complete wave run-up over average high tides would not be suitable. The site assessment considers the potential for suitability to change during the course of the grunion spawning season, which primarily ranges from March through August, due to natural seasonal sand level changes on beaches.

On Shore Placement Sites

Habitat within Placement Site Boundaries

Beach

Below is a description of the beach habitat located at each placement site.

Cardiff: The Cardiff placement site is broken into two areas, Cardiff-beach and Cardiff-nearshore. Cardiff-beach contains beach habitat that is predominantly sandy with variable cobble, ranging from sparse to localized areas of dense cobble. Sand depths during the November 2008 survey completed for the 2012 RBSP averaged 16 to 18 inches in the upper and middle tide zones and 35 inches in the lower intertidal. Beach widths above the high tide zone ranged from 0 to 1.7 feet. Within the placement site, kelp and surfgrass wrack was sparse and localized on the beach. Riprap shore protection occurred along most of the site; the wetted sand line indicated wave run-up to the revetment. Sand erosion was visible after the January 2010 storm with greater beach slope and concentrations of cobbles (SANDAG 2011). This location received approximately 89,000 cy of sand from the 2012 RBSP in fall 2012. By mid-winter 2013, much of the material had dispersed downcoast from the original receiver site footprint.

Moonlight: Beach habitat is predominantly sandy with sparse cobble throughout the tide zones. Sand depths during the July 2009 survey completed for the 2012 RBSP averaged 22 to 29 inches across tide zones. No vegetation wrack was on the beach. Sand erosion was visible after the January 2010 storm with greater beach slope, concentrations of cobbles, and exposure of substantial sandstone in the swash zone seaward of the upcoast half of the site. The sandstone was unvegetated, indicating recent scour. This location received approximately 92,000 cy of sand from the 2012 RBSP in fall 2012. By mid-winter 2013, much of the material had dispersed downcoast from the original receiver site footprint.

Leucadia: Beach habitat is sandy within the boundaries of the placement site. Sand depths averaged between 19 and 25 inches across tide zones during the July 2009 survey completed for the 2012 RBSP. Kelp and surfgrass wrack was sparse on the beach. This location did not receive material from the 2012 RBSP; however, the Batiquitos site, which is upcoast of the Leucadia site, received approximately 108,000 cy of sand from that project in fall 2012. By mid-winter 2013, much of the Batiquitos material had dispersed downcoast to Leucadia.

Solana Beach: Beach habitat is predominantly sandy with sparse cobble. Sand depths during the November 2008 survey completed for the 2012 RBSP averaged 20 to 28 inches across tide zones. The July 2009 survey indicated greater variability in sand depths, ranging from 17 inches in the upper intertidal to 27 inches in the lower intertidal. Beach widths above the high tide zone were narrow and ranged from 0 to 1.7 feet. Kelp and surfgrass wrack was sparse and localized on the beach). This location received approximately 142,000 cy of sand from the 2012 RBSP in fall 2012. Much of that material had dispersed downcoast from the original receiver site footprint by mid-winter 2013.

Torrey Pines: Beach habitat is predominantly sandy with sparse cobble throughout the tide zones. Sand depths during the November 2008 survey completed for the 2012 RBSP averaged from 20 to 30 inches across tide zones. Beach widths above the spring high tide line ranged from 0 to 5 feet. Kelp and surfgrass wrack was sparse and localized on the beach. After the January 2010 storm, sand erosion was visible along the bluff and increased cobble cover. Scoured sandstone without marine life was exposed in the lower intertidal. This location did not receive material as part of the 2012 RBSP.

Reefs

The Cardiff-nearshore placement site includes a portion of an outfall pipeline covered with riprap that supports localized occurrence of hard-bottom reef species such as giant kelp, feather boa kelp, sea palm, and sea fans. No other vegetated reef habitats occur within the Encinitas-Moonlight, Solana Beach, Leucadia, or Torrey Pines placement site footprints.

Nearby Sensitive Resources

Below is a summary of nearby sensitive resources located in proximity to each placement site.

Cardiff: The onshore Cardiff placement site is located approximately 1,000 feet from intertidal surfgrass, sensitive hard-bottom, and vegetated habitats (i.e., kelp beds and understory of algae).

Encinitas-Moonlight: Habitat directly offshore is primarily sand with sparse cobble and rocks mainly vegetated with turf algae. Sparse surfgrass has historically been mapped offshore and may occur (MEC 2000); however, the 2002 Nearshore Program did not identify any. Substantial reef with understory algae and subtidal surfgrass occurs approximately 400 to 500 feet, respectively, offshore and upcoast of the northern boundary of the site. Sensitive hard-bottom habitat is located 330 feet from the site, while intertidal surfgrass is approximately 3,000 feet. Kelp beds were mapped approximately 850 feet offshore.

Solana Beach: Intertidal surfgrass habitat occurs 2,400 feet from the site. Sensitive subtidal hard-bottom and vegetated habitats occur approximately 480 feet from the site, while sensitive hard-bottom areas are located approximately 240 feet offshore.

Leucadia: Intertidal and subtidal surfgrass and hard-bottom habitat is located approximately 150 feet from the placement site. Surfgrass was observed on low-relief rock in the minus tide zone seaward of the site boundaries during the June 2009 and January 2010 site visits completed for the 2012 RBSP. Nearshore reef understory algae

begins approximately 150 feet seaward and extends farther offshore of the proposed placement site boundaries. Kelp bed habitat was mapped approximately 1,000 feet offshore of the southern portion of the site in 2008.

Torrey Pines: Intertidal and subtidal surfgrass habitat occurs 200 feet offshore, while hard-bottom habitat occurs 150 feet offshore from the site. Nearshore reefs with understory algae are located approximately 1,000 feet downcoast and 1,400 feet upcoast of the site. Kelp bed habitat is nearly 1 mile from the site.

Critical Habitat

USFWS-designated critical habitat for the threatened western snowy plover occurs approximately 1,000 feet away from the Cardiff placement site, within the west basin of San Elijo Lagoon, as described above and shown in Figure 3.6-3. In addition, USFWS-designated critical habitat for threatened western snowy plover occurs approximately 1,400 feet upcoast of the Torrey Pines placement site.

No critical habitat exists within or in proximity to the Encinitas-Moonlight, Solana Beach, and Leucadia placement sites.

Essential Fish Habitat

As described previously, EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The Pacific Ocean (adjacent to placement sites) is designated as EFH for Pacific Groundfish and Coastal Pelagic species.

Rare, Threatened, or Endangered Species

Federally Listed Species

The following sites are located more than 1 mile from least tern and western snowy plover nesting sites (Table 3.6-4): Encinitas-Moonlight, Cardiff, Solana Beach, and Torrey Pines. The Leucadia placement site is located at distances less than 1 mile from nesting sites.

Table 3.6-4
Estimated Closest Distances to Least Tern and Western Snowy Plover Nesting Sites

Placement Sites	Nearest Nest Site*	Miles
Leucadia	Batiquitos	0.8 mi
Encinitas-Moonlight	Batiquitos	2.6 mi
Cardiff	San Elijo (historical)	1.1 mi
Cardiff	San Dieguito (new)	3.2 mi
Solana Beach	San Dieguito (new)	1.3 mi
Torrey Pines	Los Peñasquitos (historical)	0.2 mi
Torrey Pines	San Dieguito (new)	2.3 mi

*Active nesting within last 5 years except at historical and new sites.
mi = mile(s)

Grunion

California grunion is not a rare, threatened, or endangered species, but are a managed game species by CDFW and are therefore described herein. They spawn on sandy beaches primarily from March through August, with their peak season falling between late March and early June.

Prior to the 2012 RBSP, both the Solana Beach and Torrey Pines placement sites had limited spawning habitat for grunion due to narrow beach widths, unlike the Cardiff, Moonlight, and Leucadia placement sites that supported potentially suitable spawning habitat for grunion. Observations suggest that those sites that received sand from the 2012 RBSP may continue to provide grunion spawning habitat through the 2014 season and perhaps longer. This suggests Torrey Pines may still have limited spawning habitat. Observations from the 2001 RBSP indicated grunion spawning habitat was enhanced for up to 5 years at some locations.

Offshore Stockpiling Sites (SO-5/SO-6)

Overview of Site and Adjacent Locations

Both SO-5 and SO-6 consist of sandy bottom habitat with no vegetated reef habitat. No critical habitat exists within, or in proximity to, these sites and no federally or state-listed species were identified within SO-5 and SO-6.

SO-5 is located 1,000 feet or more from nearshore reefs at depths less than -30 feet and approximately 600 feet from kelp canopy mapped in 2008. SO-6 is more than 500 feet from substrate supporting kelp canopy mapped in 2008. The San Elijo wastewater discharge pipeline is located more than 500 feet upcoast. The closest nearshore reefs at depths less than -30 feet are located approximately 1,400 feet away. Proposed pipeline and monobuoy locations have the potential to be near vegetated reef, kelp habitats, and the pipeline at Cardiff.

Overview of Marine Resources

The entire Pacific Ocean is designated as EFH for Pacific Groundfish and Coastal Pelagic species. Kelp bass (*Paralabrax clathratus*) is managed as a game species by CDFW. During the 2009 survey for the 2012 RBSP, this fish species was observed within SO-5 and SO-6.

Sea turtles

Four species of sea turtles listed as federally endangered are known to migrate and forage along the California coast in nearshore and offshore habitats. These species are the green sea turtle, leatherback sea turtle, loggerhead sea turtle, and olive ridley sea turtle. Green sea turtles and loggerhead sea turtles are known to forage on benthic macroinvertebrates that occur in rooted submerged aquatic plants in addition to unvegetated subtidal flats. Leatherbacks, however, feed primarily on jellyfish in open waters. Olive ridley sea turtles are also mainly pelagic; therefore, all four species of turtle are expected to migrate through and forage within and near the sites.

Marine Mammals

Marine mammals are protected by the Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA) of 1972. Harbor seals and California sea lions are common in inshore coastal water off southern California and have the potential to occur within this offshore stockpile site. The California gray whale migrates along the southern California coast between summer feeding grounds in the Bering Sea and winter calving grounds in Baja California. Marine mammals and turtles may be in the general vicinity of dredge and transit vessels during materials placement activities.

3.6.2 CEQA THRESHOLDS OF SIGNIFICANCE

For the purpose of this analysis, the following applicable thresholds of significance have been used to determine whether implementing the proposed project would result in a significant impact. These thresholds of significance are based on Appendix G of the CEQA Guidelines, County of San Biological Resources Diego Guidelines for Determining Significance (County of San Diego 2010), and criteria developed in previous beach sand projects. A significant impact related to biological resources would occur if implementation of the proposed project would result in the following:

Sensitive Riparian and Natural Vegetation Communities

A. The project would have a substantial adverse effect on riparian habitat or another sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS.

All habitats within the San Elijo Lagoon BSA, as well as aquatic habitats (high-relief reefs and vegetated low-relief reefs), that may be located offshore of the sand placement locations, are considered sensitive based on local, regional, and state guidance, with the exception of This is macro 2eucalyptus woodland, disturbed habitat, and other land cover types such as "developed." For the purposes of this project, the term "substantial" is defined as a temporary or permanent change that would cause a loss of more than 50 percent of a sensitive habitat for more than 12 months, because greater than 50 percent loss of any sensitive habitat is considered to have the potential to threaten the continued existence of a sensitive species known to occur within San Elijo Lagoon, as described in more detail in the Sensitive Species section below (Chambers Group 2001).

In addition to sensitive habitat communities, specially designated habitats must also be considered, including USFWS critical habitat and EFH. For the purposes of this project, a permanent loss or substantial degradation of critical habitat would be considered significant.

Impacts to EFH are typically determined based on whether a project reduces quality and/or quantity of EFH, regardless of the degree to which that impact occurs. Based on the Magnuson-Stevens Act, adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species, and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. By definition, the NOAA threshold to have an adverse impact to EFH is low; however, the nature of the impact can be further qualified based on the type of impact (e.g., temporary or permanent) and whether that impact is substantial based on best professional judgment. Therefore, this section refers to impacts to EFH in terms of compliance with the Magnuson-Stevens Act, as well as whether a significant or substantially adverse impact to EFH would occur, per CEQA/NEPA (Appendix H).

Wetlands

B. The project would have a substantial adverse effect on local, state, and federally protected wetlands/waters.

The majority of San Elijo Lagoon is considered a jurisdictional water/wetland by the Corps, CDFW, RWQCB, and County of San Diego. For the purpose of this project, a substantial adverse effect on a federally protected wetland would include a permanent loss of wetlands in terms of aquatic function and value. Potential water quality impacts (including turbidity, salinity, etc.) associated with wetland function and value are addressed in Section 3.4 (Water and Aquatic Sediment Quality) and are not addressed herein.

Sensitive Species

C. Have a substantial adverse effect, either directly or through habitat modifications, on a candidate, sensitive, or special-status species listed in local or regional plans, policies, or regulations, or by CDFW or USFWS or the population or habitat of rare, threatened, or endangered species or species of special concern.

For the purposes of this project, the term "substantial" is defined as a temporary or permanent change that would cause a decline in the local population of a species to below self-sustaining levels within San Elijo Lagoon. Data are lacking for most species regarding the size of a self-sustaining population for a given area of habitat; however, for the purposes of this analysis, a 50 percent decline in the lagoon breeding population (i.e., movement out of lagoon and not direct mortality) or a temporary loss of more than 50 percent of the suitable nesting habitat for that population at the lagoon, was considered a threat to the continued existence of the San Elijo Lagoon population (Chambers Group 2001). The 50 percent threshold has been chosen based on previous environmental impact evaluation for another large lagoon restoration project, Bolsa Chica Restoration Project, and best professional judgment (Chambers Group 2001). In addition, the direct loss of adults, eggs, or young of species listed as endangered or threatened would be a significant impact. For example, an impact would be considered less than significant if the selected SELRP alternative would ultimately contribute to the long-term increase of the population even though construction would result in a temporary loss of 35 percent of the nesting areas or breeding habitat for species listed as endangered or threatened.

In addition, an increase in noise to a level that would substantially modify breeding or foraging behavior of rare, threatened, or endangered species or species of special concern would be considered significant.

D. Have a substantial adverse effect on the movement of a native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

For the purposes of this project, impacts would be considered significant if the project would substantially interfere with wildlife access to foraging habitat, breeding habitat, water sources, or other areas necessary for reproduction, or if the project would introduce roads/trails or other temporary or permanent features that would impede wildlife movement through a local or regional wildlife corridor.

Local Ordinances, Policies, Adopted Plans

E. Conflict with one or more local policies or ordinances protecting biological resources and/or conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

For the purposes of this project, an inconsistency with goals of SANDAG's Multiple Habitat Conservation Plan (MHCP) encompassing the cities of Encinitas and Solana Beach, and draft County of San Diego North County Multiple Species Conservation Program (North County MSCP), another subregional conservation planning effort, would be considered potentially significant.

3.6.3 Environmental Consequences

Potential direct and indirect impacts on biological resources would result from the SELRP. Most would be related to construction, but there would be habitat changes and impacts associated with the restored condition as well. This section evaluates direct and indirect impacts, as well as permanent and temporary impacts to biological resources.

This EIR/EIS analyzes the effects from both construction and post-construction to biological resources associated with the four restoration alternatives. Effects are evaluated within the project boundary. Due to the nature of the project, no additional buffer area is included. Effects may be negative (adverse or significant) or positive and are both discussed within this section.

Especially relevant to the significance determination under CEQA is the effect and severity of the impact on regulated or otherwise protected biological resources, specifically, jurisdictional waters, federally listed (threatened or endangered) or candidate species and the habitats they occupy, and migratory birds covered under the Migratory Bird Treaty Act (MBTA).

Lagoon Restoration

The following section discusses each of the four restoration alternatives and their potential to affect biological resources within the San Elijo Lagoon BSA.

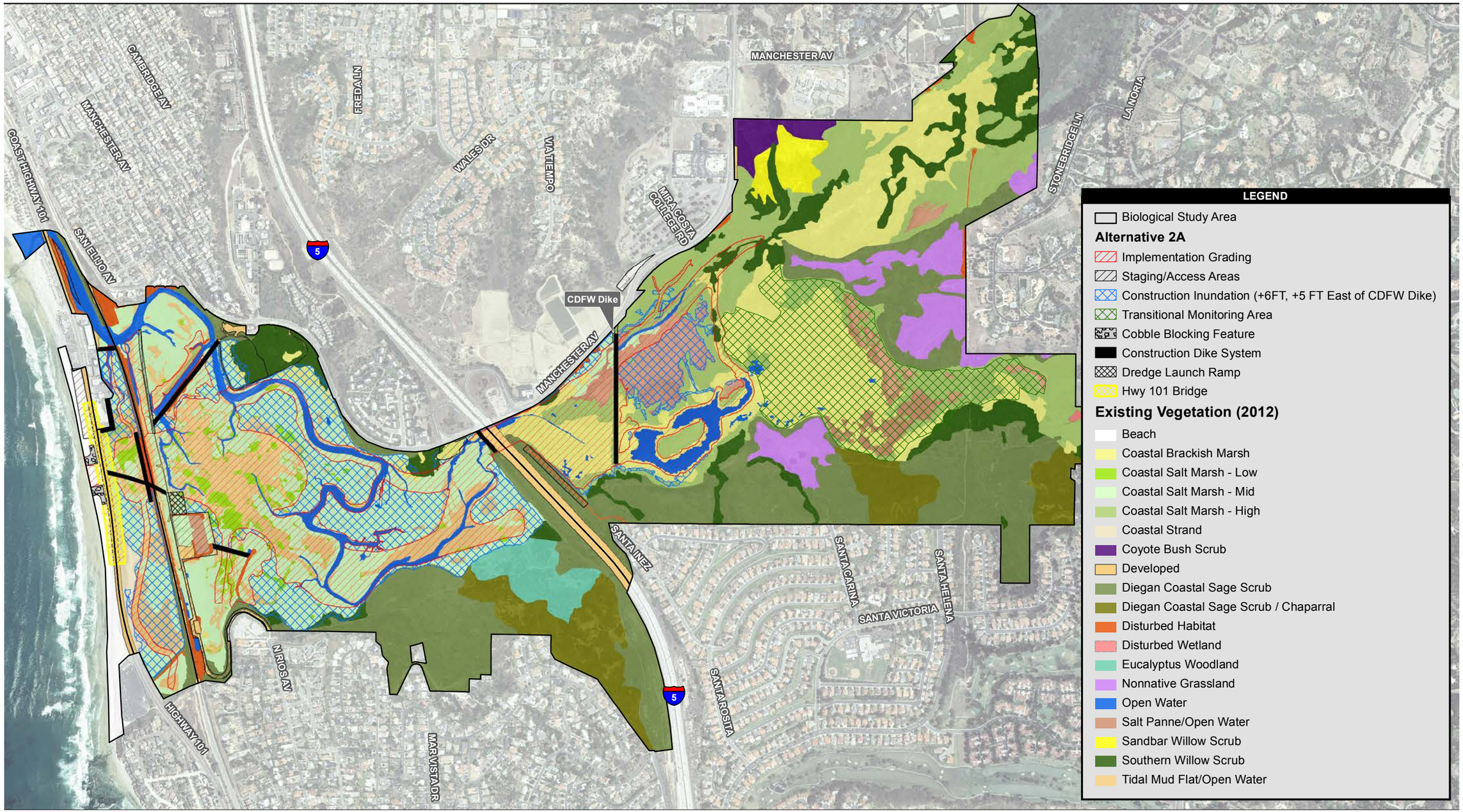
Alternative 2A–Proposed Project

Sensitive Riparian and Natural Vegetation Communities

The proposed SELRP would result in short-term and long-term changes to sensitive vegetation communities. Short-term changes would result from project construction and direct impacts to vegetation from grading, dredging, and project construction (Figure 3.6-9). Directly following construction, restoration (both active and passive) would occur in temporarily impacted areas (i.e., grading/dredging footprint). Restoration would represent long-term change to sensitive vegetation communities, as a result of the new habitat distribution associated with the modified elevation and tidal regime. These long-term changes would occur 5–10 years post-restoration, as vegetation in the lagoon becomes reestablished at the new elevations/grade. These anticipated changes to sensitive vegetation within the lagoon are described in detail below.

Short-term/Temporary

Construction of Alternative 2A would result in temporary impacts to sensitive habitats associated with grading and dredging operations (Figure 3.6-9), as well as from extended inundation. The project is anticipated to take approximately 3 years to construct and would be phased to minimize impacts to lagoon habitats, allowing for refuge for species and retaining some habitat areas at any given time during construction. Phasing includes limitations on the overall duration of time a lagoon basin would be impacted, as well as limitations on the overall inundation and construction area within a given basin. Inundation would allow for dredging of channels within each basin. As described in Chapter 2, inundation durations were minimized to the extent practicable and vary by lagoon basin (west, central, or east) (see Section 2.10.15, Project Design Features). Wet construction methods have been identified to the extent possible to minimize additional impacts associated with dry construction approaches in wetlands (PDF-15). Limits on inundation have been placed to minimize impacts due to flooding, including limiting the initiation of habitat flooding to outside the breeding season (PDF-16), utilizing flooding to flush birds where possible prior to clearing and grubbing (PDF-18), and clearing and grubbing within flooded areas or utilizing a biological monitor to flush wildlife (PDF-17). Impacts are summarized in Table 3.6-5 and are separated into two types of short-term impacts: areas that would be graded/dredged during construction, and areas that would be affected by inundation only. A complete breakdown of impacts by basin is provided in the BTR included in Appendix F.



Source: SANDAG 2012; MoffattNichol; AECOM 2013

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-9
Alternative 2A Impacts to Vegetation Communities

Path: P:\2009\09080064_SELRP_EIR\6.0 GIS\6.3 Layout\EIR_EIS\Veg_2A.mxd, 2/14/2014, sorensenj

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Table 3.6-5
Direct Project Impacts from Construction of Alternative 2A

Basin/Habitat Community	Existing Vegetation (acres) within the BSA	Alternative 2A Direct Impacts from Dredging/ Grading (acres)	Alternative 2A Direct Impacts from Inundation	Habitat Temporarily Impacted (% in BSA)
Beach	15.0	4.9	0	33%
Coastal Brackish Marsh	131.5	23.7	4.3	21%
Coastal Salt Marsh – High	120.0	12.6	3.2	13%
Coastal Salt Marsh – Low	13.3	10.2	2.4	95%
Coastal Salt Marsh – Mid	141.4	55.4	64.0	84%
Coastal Strand	5.0	1.2	1.1	46%
Coyote Bush Scrub	7.5	0	0	0%
Developed	23.4	7.3	0.1	32%
Diegan Coastal Sage Scrub	178.2	2.5	1.0	2%
Diegan Coastal Sage Scrub / Chaparral	49.3	0	0.0	0%
Disturbed Wetland	1.1	0	0	0%
Disturbed Habitat	11.9	3.4	0.6	34%
Eucalyptus Woodland	19.1	0	0.1	1%
Nonnative Grassland	33.1	0	0	0%
Open Water	40.1	25.7	2.4	70%
Salt Panne/Open Water	37.0	6.6	13.7	55%
Sandbar Willow Scrub	8.9	0	0	0%
Southern Willow Scrub	61.3	2.6	2.3	8%
Tidal Mud Flat/Open Water	63.1	42.6	15.1	91%
Grand Total	**960.2**	**197.8**	**110.6**	**32%**

Alternative 2A would result in temporary impacts to 32 percent of San Elijo Lagoon. Grading/dredging impacts would occur to approximately 198 acres (approximately 20 percent) of habitat and inundation would impact an additional 110 acres (approximately 12 percent) of habitat within the San Elijo Lagoon BSA (Figure 3.6-9). The extensive hillsides along the lagoon and the eastern end of the BSA would not be impacted by restoration construction.

The primary concern for temporal loss of habitat is reduced availability of food and shelter for resident and migratory species that rely on the lagoon. As noted above (Section 3.6.2), temporary impacts to sensitive habitats were considered significant if more than 50 percent of a sensitive habitat within the lagoon would be lost temporarily. Vegetation that would be inundated, but not graded or otherwise altered, may survive the extended inundation periods, but there is insufficient verifiable data to make an accurate conclusion as to how much of the vegetation would be expected to survive. Because areas would be inundated for 3 months or longer, it is assumed that inundated vegetation would not survive as a worst-case scenario. The adaptive management program for the project, as described in Chapter 2.11, includes measures for monitoring and maintenance activities to aid in the recovery of inundated vegetation communities.

The duration in which vegetation may be temporarily lost would vary based on the basin, type of impact (dredged/graded or inundated), species tolerance to inundation, and recovery period. This length of impact may be as short as 6–12 months for habitats inundated in the west basin, due to the shorter duration of inundation (estimated at 3 months) and may be greater than 5 years for habitats that would be grubbed and graded during construction. As shown in Table 3.6-5, restoration construction would result in greater than 50 percent temporal loss of sensitive habitats that would be significantly impacted by construction, including coastal salt marsh (low- and mid-), open water, salt panne/open water, and tidal mudflats. The temporal loss of these habitats may threaten local populations of sensitive resident species, as described further in the Sensitive Species section below. **Short-term direct impacts to coastal salt marsh (low- and mid-), open water, salt panne/open water, and tidal mudflats are therefore considered significant and adverse (Criterion A).**

Temporary impacts to beach, coastal brackish marsh, high coastal salt marsh, coastal strand, diegan coastal sage scrub, and southern willow scrub are not considered significant because greater than 50 percent of the local habitat would remain available to local resident and migratory species during construction. Prior to construction, sensitive "no construction" zones would be identified and fenced or flagged to avoid impacts outside of the identified limits of disturbance (PDF-14). These areas would be monitored throughout construction by a qualified biologist (PDF-13). **Short-term direct impacts to beach, coastal brackish marsh, high coastal salt marsh, coastal strand, diegan coastal sage scrub, and southern willow scrub are therefore considered less than significant and not substantially adverse (Criterion A).**

No direct impacts are proposed to coyote bush scrub, Diegan coastal sage scrub/chaparral, disturbed wetland, nonnative grassland, and sandbar willow scrub.

USFWS Critical Habitat

Temporary impacts to approximately 15 acres (three subunits) of USFWS critical habitat for western snowy plover containing PCEs 2 and 3 would occur as a result of construction. Although PCEs are not discretely mapped, each of these subunits has the potential to support one or more of the possible four PCEs for western snowy plover. Western snowy plover has not nested at the lagoon in more than 10 years and, as described above, the critical habitat is currently in a degraded state. However, as described in the Federal Rule, this habitat was designated with the expectation that the SELRP would improve the habitat for western snowy plover as a result of restoration (specifically the proposed nesting sites) in the long term. The Federal Register states that the restoration of degraded habitat within these three subunits would improve the habitat for western snowy plover (USFWS 2012b). The long-term monitoring and management program would include species-specific goals/actions to maintain critical habitat areas for western snowy

plover. **Therefore, temporary impacts to western snowy plover critical habitat, for the purpose of restoration, are considered less than significant and not substantially adverse (Criterion A).**

Coastal California gnatcatcher critical habitat would primarily remain unimpacted during restoration construction. There are two small areas where critical habitat exists in the vicinity of project grading and inundation. A very small area of critical habitat is mapped in the vicinity of the existing access road proposed for improvements, and a second area is mapped along the I-5 berm where the bridge is proposed to be widened by the I-5 North Coast Corridor Project. In the area of the proposed access road, impacts to critical habitat would be avoided by remaining within the existing roadbed and disturbed areas, as noted in Chapter 2 in Section 2.10.15, Project Design Features. Impacts to critical habitat in the area of the I-5 North Coast Corridor Project were considered and mitigated as a part of that project's approved EIR and Biological Opinion (Caltrans 2012; USFWS 2012a). No additional impacts to gnatcatcher critical habitat would occur in this area. **Therefore, no new impacts to coastal California gnatcatcher critical habitat would occur as a result of this restoration project and impacts are considered less than significant and not substantially adverse (Criterion A).**

Essential Fish Habitat

Construction of Alternative 2A would result in temporary and short-term impacts to EFH associated with grading and dredging operations (e.g., excavation, turbidity, sediment disruption). The project would be phased, allowing for refuge and retaining available habitat at any given time during construction. In addition, the lagoon does not support rocky reefs or eelgrass habitat; therefore, construction impacts would occur to unvegetated soft-bottom habitat, which often recovers quickly. **Therefore, short-term impacts to EFH are considered less than significant and not substantially adverse (Criterion A).**

Indirect Impacts

Indirect short-term/temporary impacts to adjacent vegetation communities, particularly uplands, are anticipated to be minimal with the implementation of Alternative 2A. Water-based construction minimizes dust and noise impacts and no indirect loss of vegetation is anticipated. **No significant or adverse indirect impacts to vegetation communities are anticipated with the proposed project (Criterion A).**

Long-Term/Permanent

Long-term changes in vegetation (5–10 years post-restoration) would occur from implementation of Alternative 2A, as shown in Table 3.6-6 and Figure 2-3. Planting to facilitate recovery of habitat dredged or inundated would occur, but as described in the Short Term Impact section above, it would take time before habitats are reestablished in the lagoon. Within 5–10 years following restoration, habitats are expected to have substantially recovered and matured. The overall acreage of sensitive habitats within the lagoon would remain approximately 960 acres. However, conversion from one sensitive vegetation community to another within the lagoon would occur with the dredging of channels/basins, grading, and improvements to hydrologic function.

Table 3.6-6
San Elijo Lagoon Restoration Project
Post-Restoration Vegetation Summary (acres)

Habitat Description	Existing (2012)	Alt 2A	Alt 1B	Alt 1A	No Project/No Federal Action
Avian Island	0	2	2	2	0
Mudflat	63	102	71	25	29
Low Marsh	13	23	51	44	51
Mid Marsh	141	124	98	140	107
High Marsh	120	107	124	145	167
Salt Panne	37	17	30	35	37
Freshwater/Brackish Marsh	132	96	99	121	131
Open Water/Tidal Channels and Basins	40	74	67	34	24
Riparian	72	67	67	70	71
Coastal Strand	5	5	5	5	5
Uplands & Others	299	292	295	299	299
Beach	15	14	15	15	15
Berms and Roads	23	24	24	24	23
Transitional (created)	0	12	12	2	0
Total[1]	**960**	**960**	**960**	**960**	**960**

[1] Totals may not sum due to rounding.

Alternative 2A incorporates hydrologic modification in the form of a new inlet located in the middle of the west basin (Figure 2-3). In addition, a subtidal basin extending from the west basin into the central basin would connect to enlarged tidal channels extending north and east. Alternative 2A would also include creation of an extensive network of tidal channels in the east basin. The tidal connection between the central and east basins would be widened and deepened.

The primary change in habitat distributions under Alternative 2A would be an increase in subtidal habitat and mudflat within the lagoon compared to both existing conditions and the

predicted No Project/No Federal Action conditions. Subtidal habitat would be increased in all three lagoon basins compared to existing conditions. Mudflat and mid-salt marsh habitats would increase due to conversion of salt panne, fresh/brackish marsh, open water/freshwater marsh, and habitats that currently occupy the transition zone.

Alternative 2A would facilitate efficient conveyance of seasonal freshwater flows through the subtidal basin and out through the new inlet. Freshwater flows could also be conveyed to the ocean via the existing inlet if naturally breached. Alternative 2A would require a new bridge on Coast Highway 101 at the new inlet location and a new railroad bridge (proposed by others) to span the new inlet. Other infrastructure, such as CBFs, would be required to increase the stability of the new tidal inlet. An avian nesting area would be established in the central basin. A large portion of the salt panne habitat in the east basin would likely transition to salt marsh, limiting management options for avian nesting.

The overall acreage of habitat available for sensitive species would remain unchanged with this alternative, but benefits from the improved hydrologic function of the lagoon are expected. When considering changes to sensitive habitats, a change from one sensitive habitat to another does not necessarily represent a positive or negative impact. Rather, the ecological ramifications of the change on sensitive species and lagoon ecology would be the primary indicators of impact. As described in Chapter 1, existing lagoon habitat is rapidly converting, with continued loss of mudflat and rapid increase in low- and mid-salt marsh. Evidence of this rapid conversion is apparent in numerous surveys over time and in recent surveys conducted between 2010 and 2012. During the 2-year period between the 2010 and 2012 surveys, low- and mid-salt marsh habitat (dominated by cordgrass and pickleweed) increased by 13 acres and mudflats decreased by 12 acres. With rapid transition to salt marsh, there is a reduction in available foraging habitat for sensitive and nonsensitive birds, which has the potential for substantial ecological changes in the lagoon and is expected to dramatically change the diversity and density of wildlife that the lagoon is able to continue to support. With implementation of Alternative 2A, the lagoon would experience improved hydrologic function and increased foraging habitat, and the rapid changes, occurring under existing conditions and projected to continue with the No Project/No Federal Action Alternative, would reverse. Species specific impacts associated with these changes are evaluated below. **With improved lagoon ecology, increased foraging for species, and no overall loss of lagoon resources, direct impacts to sensitive vegetation communities with implementation of Alternative 2A are considered less than significant and not substantially adverse (Criterion A).**

USFWS Critical Habitat

No long-term impacts to USFWS critical habitat are anticipated for western snowy plover. Western snowy plover habitat would be improved with the proposed construction of Alternative 2A, as described in the Sensitive Species section below. No long-term loss of critical habitat is anticipated with project restoration. No new or permanent impacts would occur to coastal California gnatcatcher critical habitat as a result of this project. Impacts associated with the I-5 North Coast Corridor Project would be mitigated via that project. **Therefore, long-term impacts to USFWS critical habitat are considered less than significant and not substantially adverse (Criterion A).**

Essential Fish Habitat

Construction of Alternative 2A would result in long-term beneficial impacts to EFH because it would create additional acreages of open water, tidal channels, and mudflat habitat, as well as enhance the conditions of existing subtidal habitat by increasing tidal influence within the lagoon. This additional habitat would support local fish populations and therefore would benefit EFH within the project area. **Therefore no long-term significant or substantially adverse impact to EFH is anticipated with implementation of Alternative 2A (Criterion A).**

Jurisdictional Waters and Wetlands

Short-term/Temporary

Construction of Alternative 2A would result in temporary or short-term direct impacts to jurisdictional waters and wetlands due to grading and dredging operations. Of the approximately 620 acres of jurisdictional area present in the BSA, 280 acres would be directly impacted by construction (172.5 acres from grading/dredging and 107.6 acres from inundation). These impacts would include the short-term loss of vegetation (described above), wildlife (described further below), and potential impacts to water quality associated with construction. As described in Section 3.4 (Water and Aquatic Sediment Quality), several project design features have been incorporated to reduce temporary impacts on water quality within the lagoon. Impacts to jurisdictional waters (short-term and long-term) will be further addressed in the 404(b)(1) analysis, as required by the Corps. **Due to the temporary nature of the direct impacts, and with implementation of project design features and compliance with local requirements for BMPs, short-term impacts to jurisdictional waters and wetlands associated with restoration construction are considered less than significant and not substantially adverse (Criterion B).**

Indirect Impacts

Short-term indirect impacts to jurisdictional waters would include changes in habitat or water quality that may result from project implementation. Indirect impacts to vegetation are described under sensitive vegetation communities, and impacts to water quality are described in Section 3.4. **No significant or adverse indirect impacts to wetlands are anticipated with restoration implementation (Criterion B).**

Long-Term/Permanent

Prior to construction of Alternative 2A, approximately 620 acres of the 960-acre project site was delineated as jurisdictional waters and wetlands of the U.S. and state. Following construction of Alternative 2A, conversion from one wetland type to another would occur due to dredging of channels/basins, grading of estuarine habitats, and improvements to hydrologic function. Implementation of Alternative 2A would result in permanent impacts to 12 acres (2 percent) of the jurisdictional waters and wetlands within the BSA due to the construction of the transitional areas within the east and central basins. These created transitional areas are designed to be above the high tide line, and, as such, they are not expected to meet the three-parameter wetland definition and may not be considered a wetland water of the U.S. However, a portion of these created transitional areas would likely be considered waters of the state and would still provide many of the functions and values associated with the larger lagoon ecology. The remaining jurisdictional waters and wetlands within the lagoon would be enhanced with improved hydrologic conditions and increased diversity. For example, the existing CDFW dike in the east basin would be removed and replaced with channel connections, which would increase tidal influence by allowing for salt water input and freshwater output within the east basin. Alternative 2A may result in a small decrease in jurisdictional wetland acreage overall; however, the improvement to wetland conditions and functions, as described in more detail in the 404(b)(1) alternatives analysis, would more than offset this loss. **Therefore, no long-term significant or adverse impacts to jurisdictional waters and wetlands are anticipated with implementation of Alternative 2A (Criterion B).**

Indirect Impacts

Long-term indirect impacts to jurisdictional waters would include changes in habitat or water quality that may result from project implementation. Indirect impacts to vegetation are described under sensitive vegetation communities, and impacts to water quality are described in Section 3.4. **No significant or adverse indirect impacts to wetlands are anticipated with restoration implementation (Criterion B).**

Sensitive Species

As described above, the proposed SELRP would result in short-term and long-term changes to vegetation communities that support various sensitive species. Short-term changes would result from project construction and direct impacts to flora and fauna from grading, dredging, and project construction. Long-term changes to sensitive species would occur 5–10 years post-restoration, as the lagoon conditions recover as a result of the modified hydrology and new elevations/grade.

Flora

No federally or state-listed rare, threatened or endangered plant species occur within the areas proposed for restoration. One federally listed plant species, Del Mar manzanita, and one state-listed species, Orcutt's goldenbush, occur in uplands habitat and would not be affected by the proposed project. Of the 20 nonlisted sensitive plant species detected within the project area, 19 occur outside of the proposed grading limits and maintenance activity areas and are not expected to be affected by the proposed project.

Approximately four individuals of southwestern spiny rush (CNPS List 4.2) are within the grading limits of Alternative 2A and would be directly impacted. However, this direct impact is not considered significant or adverse, due to the several hundred individuals scattered throughout the mid- and high-salt marsh habitats within the lagoon. The large population of southwestern spiny rush is expected to persist within the lagoon, as the majority of the mid- and high-salt marsh habitats would remain intact. **Therefore, no significant or substantially adverse impacts to sensitive plant populations are anticipated with construction of Alternative 2A (Criterion C).**

Fauna

Of the 94 special-status wildlife species that have potential to occur within the BSA, seven federally and/or state-listed species were detected during previous studies and are considered resident/breeding within the BSA. These include the federally listed coastal California gnatcatcher and western snowy plover; the federally and state-listed light-footed clapper rail, California least tern, southwestern willow flycatcher, and least Bell's vireo; and the state-listed Belding's savannah sparrow. These seven bird species utilize different habitats within the lagoon and as such are expected to be influenced differently by the restoration project. Potential impacts to nonlisted special-status species known to occur and possibly breed on-site are described in detail in the BTR. Within the EIR/EIS, the impacts to nonlisted special-status species are captured within the listed species discussion and impact analysis as the listed species cover broad

geographic areas and habitats within the BSA (Appendix F). There is the potential for short-term/temporary effects as well as long-term/permanent effects associated with the implementation of Alternative 2A. These effects may be considered negative (impact) or positive (benefit); both are discussed below.

SHORT-TERM/TEMPORARY

DIRECT

Direct short-term/temporary effects may include the short-term loss of nesting and/or foraging habitat for sensitive species resulting from construction activities.

As part of the restoration effort, nesting and/or foraging habitat would be temporarily impacted during construction. These direct temporary impacts are summarized in Table 3.6-7 and are separated into two types of short-term impacts: areas that would be graded/dredged during construction, and areas that would be affected by controlled inundation only. Although both impacts are direct, the duration of the temporary impacts associated with inundation are less predictable as these vegetation communities are adapted to tolerate long periods of inundation. Professional experience in various lagoons including Tijuana Estuary, San Diego River, and Bolsa Chica has shown impacts to some salt marsh vegetation species after 8 weeks of inundation; others tolerate 3 months, while others may tolerate even longer periods. This evaluation assumes that more than 3 months of contiguous inundation would result in vegetation mortality. Phased construction across basins limits inundation duration and geographic extent, thereby reducing impacts to nongraded inundated areas as well as preserving some tidal and noninundated habitat areas. Construction would also restrict vegetation removal activities to outside of the nesting season. In addition, discrete locations have been identified where temporary dikes would be placed to limit inundation and allow for species refugia.

Both least Bell's vireo and southwestern willow flycatcher have been observed in low numbers (less than five in any given year) within the central and east basins, foraging primarily within the southern willow scrub habitat. Neither species has been documented to breed on-site although there is the potential that successful vireo breeding has occurred (Patton 2010, 2012a). Construction of Alternative 2A would directly impact 4.9 acres (8 percent) of the southern willow scrub riparian habitat within the lagoon as a result of grading and inundation (Table 3.6-7). Both least Bell's vireo and southwestern willow flycatcher are migratory birds, which means these species only occur in San Elijo Lagoon during a portion of the year (i.e., spring and summer months). As vegetation would be removed outside of the breeding season and both species use the site primarily for foraging during summer months, the short-term impact to 8 percent of the southern willow scrub riparian habitat is not substantial and would not result in a

Table 3.6-7
Alternative 2A Impacts to Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Existing Habitat (acres)	Habitat Impacted by Grading		Habitat Impacted by Inundation		Total Direct Impact to Existing Habitat	
				Acres	Percent	Acres	Percent	Acres	Percent
light-footed clapper rail	Nesting/Foraging	Coastal Brackish Marsh	131.5	23.7	18%	4.3	3%	28.0	21%
		Coastal Salt Marsh – Low	13.3	10.1	76%	2.5	19%	12.6	95%
		Total Nesting	144.8	33.8	23%	6.8	5%	40.6	28%
	Foraging	Mudflats	63.1	42.6	68%	15.1	24%	57.7	91%
		Coastal Salt Marsh – Mid	141.4	55.5	39%	64.1	45%	119.6	85%
		Coastal Salt Marsh – High	120	12.6	11%	3.2	3%	15.8	13%
		Total Foraging	324.5	110.7	34%	82.4	25%	193.1	60%
California least tern	Nesting	Salt Panne	36.9	6.6	18%	13.7	37%	20.3	55%
		Coastal Strand	5	1.2	24%	1.1	22%	2.3	46%
		Nesting Area**	0	0	0%	0	0%	0.0	0%
		Total Nesting	41.9	7.8	19%	14.8	35%	22.6	54%
	Foraging	Subtidal/Channels	40.1	25	62%	2.4	6%	27.4	68%
		Beach	15	0	0%	0	0%	0.0	0%
		Total Foraging	55.1	25	45%	2.4	4%	27.4	50%
western snowy plover	Nesting	CDFW Dike	0.4	0.4	100%	0	0%	0.4	100%
		Salt Panne	36.9	6.6	18%	13.7	37%	20.3	55%
		Coastal Strand	5	1.2	24%	1.1	22%	2.3	46%
		Nesting Area**	0	0	0%	0	0%	0.0	0%
		Total Nesting	42.3	8.2	19%	14.8	35%	23.0	54%
	Foraging	Mudflats	63.1	42.6	68%	15.1	24%	57.7	91%
		Beach	15	0	0%	0	0%	0.0	0%
		Total Foraging	78.1	42.6	55%	15.1	19%	57.7	74%

Species	Habitat Suitability*	Habitat Type	Existing Habitat (acres)	Habitat Impacted by Grading		Habitat Impacted by Inundation		Total Direct Impact to Existing Habitat	
				Acres	Percent	Acres	Percent	Acres	Percent
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	2.54	1%	1	1%	3.5	2%
		Diegan Coastal Sage Scrub/Chaparral	49.3	0	0%	0.03	0%	0.0	0%
		Coyote Bush Scrub	7.5	0	0%	0	0%	0.0	0%
		Total Nesting/Foraging	234.9	2.54	1%	1.03	0%	3.6	2%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	0	0%	0	0%	0.0	0%
		Southern Willow Scrub	61.4	2.6	4%	2.3	4%	4.9	8%
		Total Nesting/Foraging	70.4	2.6	4%	2.3	3%	4.9	7%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	2.6	4%	2.3	4%	4.9	8%
		Total Nesting/Foraging	61.4	2.6	4%	2.3	4%	4.9	8%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	55.5	39%	64.1	45%	119.6	85%
		Coastal Salt Marsh – High	120	12.6	11%	3.2	3%	15.8	13%
		Total Nesting	261.4	68.1	26%	67.3	26%	135.4	52%
	Foraging	Coastal Salt Marsh – Low	13.3	10.1	76%	2.5	19%	12.6	95%
		Total Foraging	13.3	10.1	76%	2.5	19%	12.6	95%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions a portion of the nesting area is classified as salt panne.

decline in the local population below self-sustaining levels. **Therefore, short-term direct impacts to least Bell's vireo and southwestern willow flycatcher would be less than significant and not substantially adverse (Criterion C).**

Coastal California gnatcatcher has been observed along the periphery of San Elijo Lagoon within sage scrub and chaparral habitats. As part of construction, an access road along the southwest corner of the central basin would need to be enhanced (widened) to accommodate construction vehicular traffic. All enhancements to the access road are expected to be contained within the existing footprint. However, as gnatcatchers have been observed adjacent to the road, there is the potential for short-term direct impacts. In addition to the access road, construction vehicles would need to temporarily access the created transitional area to deposit material to the north of the access road. As such, brush clearing may be needed along the small eastern footpath, to a width of approximately 12 feet, as well as minor grading to fill holes. There is the potential to impact nesting and foraging coastal California gnatcatchers during vegetation removal. To avoid this potential short-term direct impact, the project has included a project design feature that limits vegetation clearing to outside of the bird nesting season (PDF-12). Outside the nesting season, resident gnatcatchers may be present in the area. However, due to their high mobility, clearing vegetation out of the breeding season, coupled with the presence of a bird monitor (PDF-13) who would observe vegetation removal and stop work if needed, short-term direct impacts to coastal California gnatcatcher associated with vegetation clearing would be avoided. Impacts associated with vegetation clearing are not considered substantial and would not result in a decline in the local population below self-sustaining levels. **Therefore, short-term direct impacts to coastal California gnatcatcher are considered less than significant and not substantially adverse (Criterion C).**

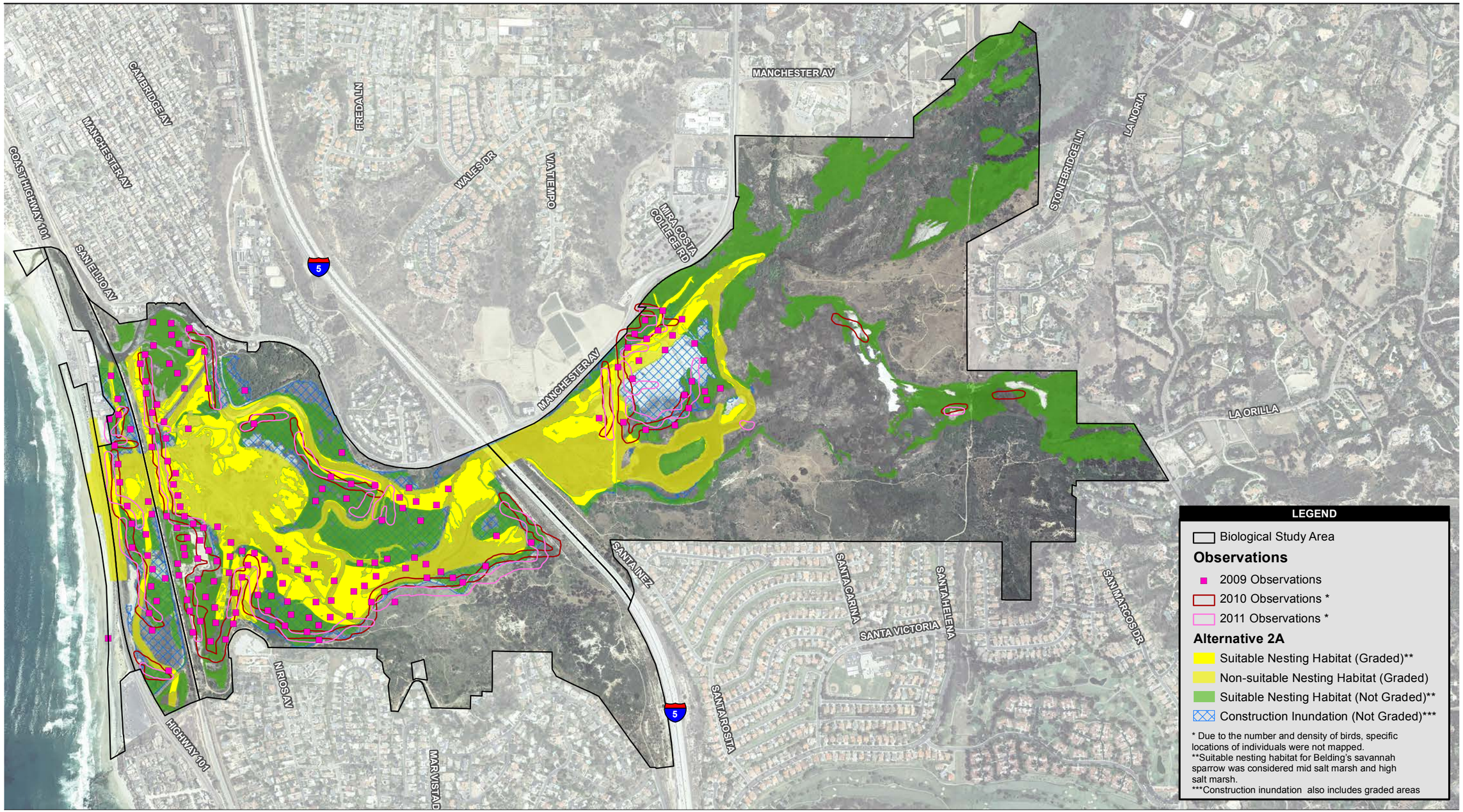
Both California least tern and western snowy plover are documented annually foraging and roosting at San Elijo Lagoon, but neither is known to breed in the lagoon. Foraging nonlisted special-status species are discussed in the BTR (Appendix F). The western snowy plover forages on mudflats while the least tern utilizes subtidal channels and open water within the lagoon. Impacts to foraging habitat for both species would occur during construction with 4.9 (33 percent) acres of beach, 27.4 (68 percent) acres of open water/tidal channels, and 57.7 acres (91 percent) of mudflat disturbed as a result of grading and controlled inundation for Alternative 2A. A total of 27.4 acres (50 percent) of California least tern and 57.7 acres (74 percent) of western snowy plover suitable foraging habitat would be impacted as a result of construction for Alternative 2A. All impacts to foraging habitat would be phased across the three lagoon basins, and within each basin (i.e., daily dredging focused in a small area), so that large contiguous areas of foraging habitat would remain at any given time. Foraging species are highly mobile and move throughout the lagoon as well as up and down the coast; as such the temporary loss of their potential foraging habitat is not expected to have a substantial adverse effect on these species. In

addition, many of these areas post-restoration are expected to return to the same habitat type but with improved conditions as a result of improved hydrology. Although short-term impacts to foraging habitat would occur, short-term benefits are also expected. Sediment-dwelling organisms would be released into the water column during dredging, which may improve foraging efficiency for diving birds such as the least tern. The benthic community that resides in the mudflats would be temporarily impacted; recovery time for these communities is highly variable with location and environmental conditions but may be relatively rapid. The recovery of the benthic community would be monitored as part of the monitoring and maintenance program. The relatively quick recovery time coupled with improved tidal hydrology and water quality is expected to enhance the benthic community within the lagoon and in particular the mudflats. The improved conditions would result in higher productivity in the restored mudflats and direct benefits to birds that forage on them, such as the western snowy plover. Similarly, the improved hydrologic and water quality conditions are expected to have a positive effect on the fish community, which is the primary food of California least tern. **Therefore, short-term direct impacts to western snowy plover and California least tern are considered less than significant and not substantially adverse (Criterion C).**

Belding's savannah sparrow occupy mid- and high-marsh habitat throughout San Elijo Lagoon but are particularly dense in the central basin and western portion of the east basin where pickleweed-dominated mid-marsh habitat is prevalent. As a result of dredging and controlled inundation, Alternative 2A would temporarily impact 119.6 acres (85 percent) of mid-marsh and 15.8 acres (13 percent) of high-marsh habitat across the three basins (BTR; Table 3.6-7, and Figure 3.6-10). As a result of construction for Alternative 2A, 135.4 acres out of 261.4 acres (52 percent) of suitable nesting habitat for Belding's savannah sparrow would be impacted. Although Belding's savannah sparrows maintain territories, they do not often nest in the exact same location. In addition, the size of the territories and their boundaries are variable and change year to year based on environmental conditions, with expansion in dry years and contraction in wet years. It is anticipated that the resident birds would respond to the restoration as they do to seasonal variability by shifting and contracting their territory size to accommodate the new acreage available. The project would minimize impacts by removing vegetation outside of the breeding season to avoid direct impacts to Belding's savannah sparrow and to allow the birds time to establish new breeding territories in unimpacted habitat. In addition, the project has included the creation of dry and noninundated refugia during Phase 1 and Phase 2 to maximize the potential breeding habitat available during construction. Finally, the project includes a habitat enhancement plan as a design feature that would be developed and implemented prior to and during construction to enhance target locations of unimpacted suitable habitat for Belding's savannah sparrow (PDF-20). The habitat enhancement plan would allow for refugia during construction, when suitable breeding and foraging habitat areas would be reduced. The plan would include measures such as removal of perches that competitor birds (song sparrow) use,

removal of non-pickleweed vegetation, and predator control. Belding's savannah sparrow is a year-round resident and project construction would result in the temporary loss of greater than 50 percent of their nesting habitat (mid- and high-salt marsh). This temporary construction impact is considered a significant impact to the local population. **As such, Alternative 2A would have a significant and adverse short-term direct impact on Belding's savannah sparrow (Criterion C).**

Light-footed clapper rails are year-round residents in the lagoon nesting in low-marsh and coastal brackish marsh habitat. Alternative 2A would directly impact 40.6 acres (28 percent) of existing suitable nesting habitat through both direct grading and controlled inundation (Table 3.6-7 and Figure 3.6-11). These direct impacts would affect both the low-marsh and brackish marsh habitat that supports this species. The project has proposed design features to minimize impacts to wildlife (birds in particular) that would be associated with dredging and other earth work. Project design features include the removal of vegetation outside of the bird breeding season to avoid direct impacts to species and to allow the birds time to establish new breeding territories in unimpacted habitat (PDF-12). In addition, dry and tidal refugia have been included in the project to provide continued breeding opportunities for the species. These wildlife refugia are focused on the west basin and the western portion of the central basin where the clapper rail population is smallest (two pairs in 2013) and as such can likely accommodate those individuals. The remaining population (18 pairs) is focused in the eastern basin within the brackish marsh, with most of the 2013 observations occurring east of the grading and controlled inundation limits. The project also includes a design feature to implement a habitat enhancement plan prior to and during construction to enhance target locations of unimpacted habitat that may be suitable for clapper rail. The habitat enhancement plan would allow for additional refugia during construction when suitable habitat areas would be reduced. The plan would include things such as nesting platforms, focused cordgrass plantings, and fencing to increase protection from predators and people, as well as select predator control. In addition to direct impacts associated with temporary habitat loss, light-footed clapper rail is a year-round residents in the lagoon and are considered difficult to flush by local experts; as such, there is the potential for direct mortality during vegetation removal. In an effort to avoid direct take of this species, the project would take advantage of a natural behavior in which clapper rail move to higher elevations during inundation events. Although light-footed clapper rail can swim, it is not preferred and cannot be sustained for long periods of time. The project would initiate inundation (as described in construction phasing, Chapter 2) outside of the nesting season and allow adequate time for clapper rail and other wildlife to move to higher ground along the periphery of the lagoon. Inundation would be maintained for dredging purposes but would also be used to conduct vegetation grubbing and removal to maximize avoidance of clapper rail when outside of their preferred habitat. **With implementation of project design features and construction monitoring, and because greater than 50 percent of breeding habitat would remain**



Source: SANDAG 2012; Patton 2010, 2011, 2012; AECOM 2012

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-10
Belding's Savannah Sparrow
Suitable Nesting Habitat Impact Analysis, Alternative 2A

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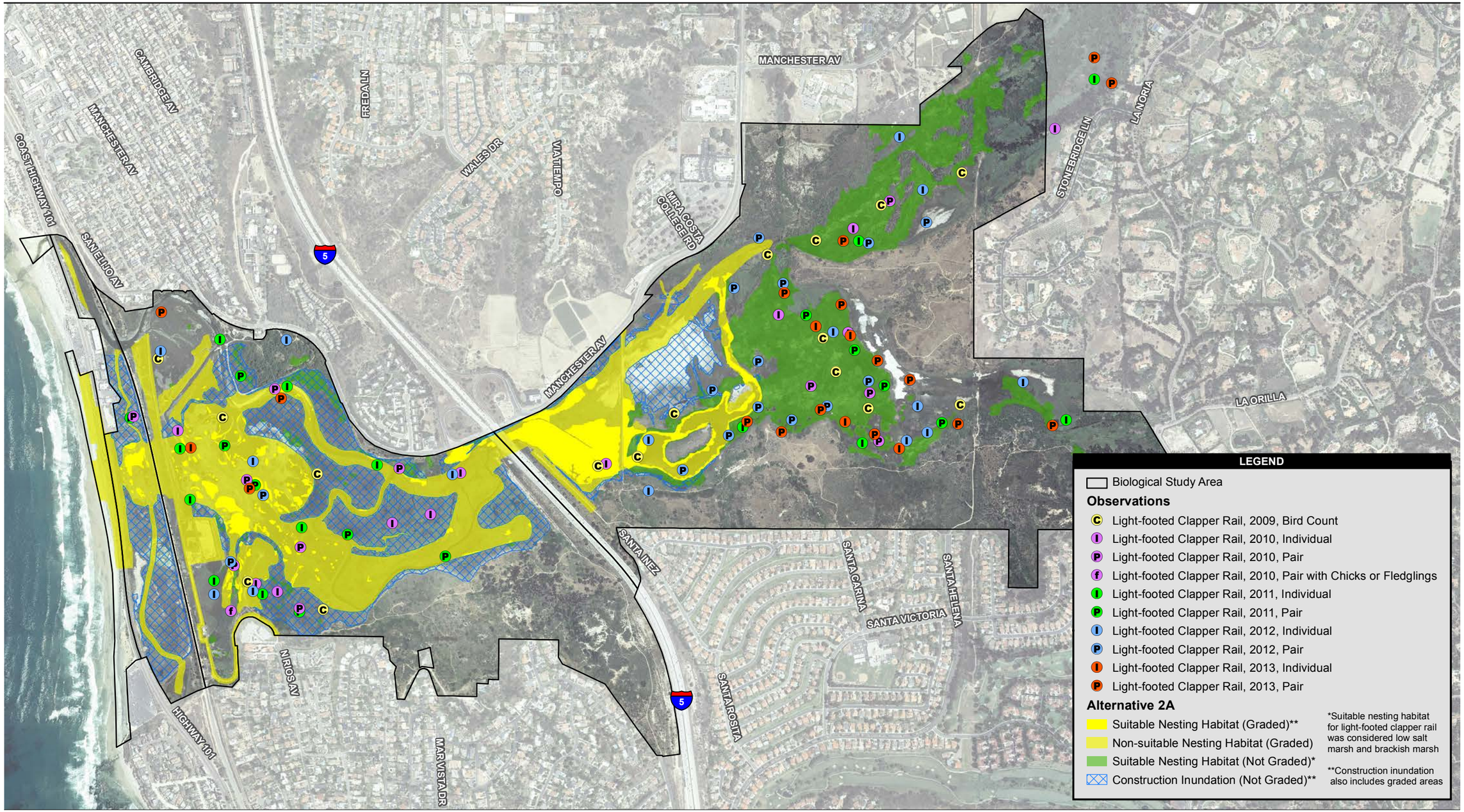

Source: SANDAG 2012; Zembal 2011, 2012; AECOM 2014

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Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-11
Light-footed Clapper Rail
Suitable Nesting Habitat Impact Analysis, Alternative 2A

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available during construction of the proposed project, short-term direct impacts on light footed clapper rail are considered less than significant and not substantially adverse (Criterion C).

INDIRECT

Indirect short-term/temporary effects to sensitive species may include increases in exposure to predators, degraded water quality, disturbed unconsolidated sediment, night lighting, and noise.

During construction, and as habitat becomes reestablished on-site, Belding's savannah sparrow and light-footed clapper rail may be exposed to higher predation as they would be more concentrated in the remaining unimpacted habitat, much of which is located along the perimeter of the lagoon. In addition, many of the unimpacted areas considered suitable nesting habitat for these species are not currently used for nesting, indicating it may not be preferred nesting habitat. To reduce temporary impacts to marsh birds resulting from the indirect effects of the short-term loss of nesting and foraging habitat, the project has included a variety of design features such as preparation and implementation of a habitat enhancement plan and a predator control program (PDF-20), as described above under direct short-term/temporary impacts.

During construction, sensitive birds using the lagoon may be exposed to degraded water quality resulting from dredging and other sediment-disturbing activities. These activities may increase turbidity and the presence of unconsolidated sediments, which could lower visibility and make foraging more difficult. The increase in turbidity and unconsolidated sediments, resulting in lowered visibility, would occur relatively close to the active dredge and other construction activities and would dissipate with distance. In addition, after the equipment ceases work in any given area the material should reconsolidate within a short amount of time (hours if not a few days). As the dredge is slow moving, impacts would be isolated to discrete areas on any given day, leaving many areas within the working basin still suitable for foraging. In addition, the other basins not under active construction in the phasing scheme would also be available for foraging. Dredge operations would occur 24 hours a day, and limited night lighting would be required. Lighting would be minimal at night, as construction would be limited to dredge operation only. Lighting would be shielded away from residents and sensitive habitat areas (PDF-7). Due to the daily isolation and concentration of the impact (immediate proximity to the dredge), and the availability of other foraging habitat, these impacts are not expected to substantially adversely affect sensitive bird species. In addition, the project would implement BMPs to further reduce water quality impacts and the indirect effects to sensitive birds (see Section 3.4 [Water and Aquatic Sediment Quality]).

With implementation of project design features, short-term/temporary indirect impacts to sensitive species resulting from predation, lighting, and water quality are considered less than significant and not substantially adverse (Criterion C).

In addition to indirect impacts described above, there is also the potential for short-term indirect noise impacts to sensitive species as a result of construction activities. As described in Section 3.12 (Noise), existing ambient noise levels at San Elijo Lagoon are considered moderate for a natural setting and are directly related to the numerous transportation corridors that traverse the lagoon. The largest contributors to ambient noise levels are I-5, separating the lagoon's largest two basins, and Coast Highway 101 near the western edge of the lagoon. In addition, Manchester Road borders the northern edge of the lagoon and the railroad separates the west and central basins. Short-term noise measurements ranged from 47.0 to 65.4 A-weighted decibels (dBA) L_{eq} with corresponding maximum noise levels (loudest single moment) ranging from 58.2 to 86.7 dBA L_{max}. The Draft Encinitas General Plan Update (City of Encinitas 2012) included a model of existing traffic noise contours near the lagoon (excluding the railroad), which is reproduced in Section 3.12. As shown, the highest noise levels are found closest to I-5 and reach 80 dBA community noise equivalent level (CNEL). Noise dissipates exponentially and, as such, the greatest reduction occurs in short distances from the source. The contours illustrate that the quietest areas in the lagoon are located in the middle and eastern portions of the east basin and the southwest corner of the central basin (although the railroad was not included in the contours). Ambient CNEL noise levels do not drop below 60 dBA until the eastern edge of the BSA.

The addition of construction noise to the lagoon environment has the potential to impact sensitive birds throughout the year. An increase in ambient noise levels could disrupt nesting and breeding behaviors that play an important role in the reproduction of wetland species such as the light-footed clapper rail, Belding's savannah sparrow, western snowy plover, California least tern, least Bell's vireo, southwestern willow flycatcher, and upland species such as the coastal California gnatcatcher. In addition, elevated noise levels have the potential to affect bird foraging behavior during the nonbreeding season. Construction equipment may vary, but it is assumed that the loudest continuous noise would be generated by dredging activity and the use of diesel engines. For the purposes of the noise analysis, a dredge was assumed using hydraulic a diesel engine, which equates to 73 dBA L_{eq} at 50 feet (Section 3.12). Unlike stationary equipment, the dredge would be mobile in the lagoon and the potential for noise impact would travel with the machinery. Dredging activity would occur up to 24 hours a day for the duration of construction. In addition to dredging, other noise-generating equipment may be used during dry construction. A worst-case scenario for equipment usage noise was developed based on two dump trucks, a bulldozer, and a large backhoe working simultaneously in a single location. This worst-case scenario resulted in an average noise level of approximately 81 dBA L_{eq} at 50 feet. It is unlikely that all of the equipment in the worst-case scenario would be used simultaneously or at the same

location; however, this is the maximum anticipated noise level for this type of project and allows for a conservative estimate of impacts. See Section 3.12 for a detailed discussion of noise.

Species that occupy habitat at the lagoon edge, or outside the impact footprint, would be less affected by noise than those species occurring within the impact footprint. These edge species include least Bell's vireo, southwestern willow flycatcher, and coastal California gnatcatcher. Sensitive birds, including Belding's savannah sparrow and light-footed clapper rail, currently forage and breed throughout the lagoon and can be found distributed throughout the noise contours where appropriate foraging and nesting habitat occurs. Although the ambient noise levels are high for a natural system and the species have adapted to them, the addition of a dredge and other construction equipment would increase ambient levels. Currently, noise levels for the dredge are estimated at 73 dBA CNEL at 50 feet and 67 dBA CNEL at 100 feet. Other individual pieces of construction equipment may reach maximum noise levels of 80 dBA at 50 feet for most equipment (Section 3.12), but use of these types of large equipment is anticipated to be localized to areas that are likely to support dry construction (i.e., along the access road, CDFW dike, utility corridor, and nesting area). When in proximity to wildlife, the effects of dredge and other construction noise would likely be pronounced and may result in modified foraging or breeding behavior. The greatest impact from noise would occur within the first 200 feet of equipment and would dissipate exponentially with distance. For example, one piece of equipment that generates a maximum noise level of 80 dBA at 50 feet (typically with a usage factor of 40 percent; i.e., fraction of time that the equipment is operated at full power) would attenuate to 60 dBA L_{eq} 240 feet from the source. The noise impact would be more pronounced within the quieter areas of the lagoon as opposed to the louder areas near the roads. The dredge is slow moving and construction would occur in one basin at a time; therefore, quieter habitat would always be available for birds to relocate to. However, relocation during the breeding season is not feasible for nesting birds. Avoiding construction during the breeding season was evaluated as part of the development process for this project, which included participation by resource agencies. Avoiding the breeding season would almost double the length of construction and might in fact pose a larger impact to resident marsh birds, including the listed light-footed clapper rail and Belding's savannah sparrow, that breed in the lagoon. As such, the contiguous construction phased across basins is the project's best attempt to minimize overall noise impacts to sensitive species.

While birds within a substantial portion of the lagoon are already subject to elevated noise levels associated with the various transportation corridors, there is still a potential for construction noise to negatively impact breeding and foraging behavior. The movement of construction activities and the distribution and mobility of the wildlife, make minimizing the effects of noise with attenuating devices virtually impossible. **As such, noise effects on sensitive birds are considered significant and adverse (Criterion C).**

In addition to noise generated by construction equipment, an increase in noise associated with vehicular traffic may also affect sensitive species. Most of the staging areas and construction traffic routes occur outside of the lagoon environment or on the periphery where ambient noise levels from existing traffic already exist. The one vehicle route that coincides with sensitive birds is the southwest entry point in the central basin where vehicles would enter off of North Rios Avenue and travel west into the lagoon. Four coastal California gnatcatchers have been observed along this access route in previous years and are expected to nest in this area. Although implementation of the proposed project would increase the frequency of vehicular traffic along this access route, this is an area that is already being used as a maintenance corridor for the existing pump station, the railroad, and the transmission line. Birds nesting in this area are accustomed to vehicular traffic and are not expected to be substantially affected by a minor increase in traffic volume and the associated vehicular noise. **Noise impacts to birds from vehicular traffic is therefore considered less than significant and not substantially adverse (Criterion C).**

LONG-TERM/PERMANENT

DIRECT

Direct long-term/permanent effects to sensitive species include the active conversion of nesting and/or foraging habitat to another habitat type, modified lagoon conditions, and long-term maintenance and operation.

As described above, suitable habitat for sensitive species would be changed and/or converted as a result of the proposed restoration project. The direct permanent changes to suitable habitat for sensitive species are summarized in Table 3.6-8. This change may include a direct increase or decrease in the total acreage of a specific habitat type post-restoration. Habitat may be actively converted (graded) or passively converted; i.e., a predictable change resulting from the new hydrology pattern associated with the restoration alternative. Implementing Alternative 2A, tidal hydrology would be extended to the east basin and the lagoon would have a modified high tide line of +4.4 feet NGVD, which is higher than the existing high tide line of +3.5 feet NGVD. As a result of the increased tidal expression (lateral distance tide moves into the lagoon) and the elevated high tide line, areas below the high tide line that are not graded as part of the restoration project may passively convert as a result of increased exposure to salt water and improved freshwater export. These areas are expected to begin conversion immediately post-restoration as a result of exposure to the new tidal regime and the corresponding changes to tidal inundation frequencies. These areas would convert in a predictable manner and as such their acreages have been included in the post-project habitat calculations and factored into this discussion regarding long-term permanent direct impacts to sensitive species.

Table 3.6-8
Alternative 2A Existing and Post-Construction Acreage of Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Habitat Acreage Post-Restoration	Net Change in Habitat Acreage Post-Restoration	Percent Change Post-Restoration
light-footed clapper rail	Nesting/Foraging	Coastal Brackish Marsh	131.5	96	-35.5	-27%
		Coastal Salt Marsh – Low	13.3	23	9.7	73%
		Total Nesting	144.8	119	-25.8	-18%
	Foraging	Mudflats	63.1	102	38.9	62%
		Coastal Salt Marsh – Mid	141.4	124	-17.4	-12%
		Coastal Salt Marsh – High	120	107	-13	-11%
		Total Foraging	324.5	333	8.5	3%
California least tern	Nesting	Salt Panne	36.9	17	-19.9	-54%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	2	2	200%
		Total Nesting	41.9	24	-17.9	-43%
	Foraging	Subtidal/Channels	40.1	74	33.9	85%
		Beach	15	14	-1	-7%
		Total Foraging	55.1	88	32.9	60%
western snowy plover	Nesting	CDFW Dike	0.4	0	-0.4	-100%
		Salt Panne	36.9	17	-19.9	-54%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	2	2	200%
		Total Nesting	42.3	24	-18.3	-43%
	Foraging	Mudflats	63.1	102	38.9	62%
		Beach	15	14	-1	-7%
		Total Foraging	78.1	116	37.9	49%

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Habitat Acreage Post-Restoration	Net Change in Habitat Acreage Post-Restoration	Percent Change Post-Restoration
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	175.56	-2.54	-1%
		Diegan Coastal Sage Scrub/Chaparral	49.3	49.3	0	0%
		Coyote Bush Scrub	7.5	7.5	-0.02	0%
		Total Nesting/Foraging	234.9	232.34	-2.56	-1%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	9	-0.06	-1%
		Southern Willow Scrub	61.4	58.8	-2.6	-4%
		Total Nesting/Foraging	70.4	67.74	-2.66	-4%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	58.8	-2.6	-4%
		Total Nesting/Foraging	61.4	58.8	-2.6	-4%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	124	-17.4	-12%
		Coastal Salt Marsh – High	120	107	-13	-11%
		Total Nesting	261.4	231	-30.4	-12%
	Foraging	Coastal Salt Marsh – Low	13.3	23	9.7	73%
		Total Foraging	13.3	23	9.7	73%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions, a portion of the nesting area is classified as salt panne.

Both least Bell's vireo and southwestern willow flycatcher utilize riparian habitat on-site for foraging habitat. Both species have been observed in low numbers (less than five in any given year) within the central and east basins, primarily within the southern willow scrub habitat. Neither species has been documented to breed on-site although vocalizing male vireos (three individuals) were detected in 2011 and may indicate that successful breeding has occurred (Patton 2010, 2012a). Alternative 2A would actively convert (i.e., grade) 4 percent of the southern willow scrub riparian habitat within the lagoon as a result of the expansion of tidal channels in the east basin and widening of tidal channels in the central basin (Table 3.6-8). As least Bell's vireo and southwestern willow flycatcher use the site primarily for foraging and occur in low numbers, the loss of 4 percent of southern willow scrub riparian habitat is not substantial and would not result in a decline in the local population below self-sustaining levels. **Therefore, impacts to least Bell's vireo and southwestern willow flycatcher with project implementation would be less than significant and not substantially adverse (Criterion C).**

Coastal California gnatcatcher are observed along the periphery of San Elijo Lagoon within the sage scrub and chaparral habitats. As part of construction, an access road along the southwest corner of the central basin would be widened to accommodate construction vehicular traffic. This work is expected to occur within the existing road footprint. Table 3.6-8 shows up to 2.54 acres (1 percent) of permanent impacts associated with the project. These impacts include a buffer around the North Rios Avenue access road as well as the I-5 North Coast Corridor Project. The access road enhancement is expected to occur within the existing footprint, and the small trail that would be expanded to temporarily accommodate construction equipment would be restored following construction. The impacts associated with the I-5 North Coast Corridor Project are evaluated and mitigated under a separate EIR/EIS (Caltrans 2012). As such, there would be no direct impacts to occupied gnatcatcher habitat. However, in an effort to be conservative regarding long-term permanent impacts, the project evaluated the potential to impact 0.68 acre of occupied coastal sage scrub habitat along the access road off of North Rios Avenue. Over the last 5 years, two or less coastal California gnatcatcher territories were located annually within the vicinity of the road improvements area. Although coastal California gnatcatcher often occupy the same territory over consecutive years, their territories fluctuate in size and nesting often occurs throughout that territory. Any vegetation removal that would occur for the road enhancement could be narrow and linear (parallel to the existing access road). As such, impacts to any existing gnatcatcher territories would occur along the margin of the territory and would not result in the entire loss of any territories. Therefore, future nesting in this area is expected to continue following widening of the access road. The acreage associated with the access road improvements (up to 0.7 acre) in addition to the other direct impacts associated with the larger restoration effort (1.8 acres) is the equivalent of 1 percent of the suitable nesting habitat for coastal California gnatcatcher. Impacts associated with the loss of 1 percent of suitable habitat is not considered substantial and would not result in a decline in the local population below self-

sustaining levels. **Therefore, impacts to coastal California gnatcatcher with project implementation would be less than significant and not substantially adverse (Criterion C).**

Both California least tern and western snowy plover are documented annually, foraging and roosting at San Elijo Lagoon. Historically, both species nested on-site; however, neither species has successfully nested on-site since 2002 (Patton 2010). Ideal nesting sites for each species are similar, consisting of undisturbed, sparsely vegetated, flat areas with loose, sandy substrate. Potential nesting habitat for these species within the lagoon includes the salt panne, coastal strand, and CDFW dike. Alternative 2A would permanently decrease suitable nesting habitat for California least tern by 6.8 acres (16.1 percent of suitable nesting habitat) and decrease suitable nesting habitat for western snowy plover by 7.2 acres (16.9 percent of suitable nesting habitat). As neither species currently breeds on-site, the loss of nesting habitat does not substantially affect either species. Following restoration, both species are expected to benefit from the restoration of the lagoon. Foraging habitat for both species would increase with an 85 percent increase in open water and subtidal channels used by California least tern and a 62 percent increase in mudflat used by western snowy plover. The condition of foraging habitat is also expected to improve as a result of restoration due to tidal influx and improved benthic community. The improved tidal circulation and restoration to appropriate habitat elevations would enhance environmental conditions for the prey communities that both birds feed on. The regular influx of tidal waters is expected to deliver larvae to the site, which may in turn increase densities and species richness of the benthic community. This directly benefits western snowy plover in addition to other foraging birds. Similarly, tidal circulation would improve environmental conditions for the fish community, which would benefit least tern and other diving birds. The restoration project would directly benefit these species that regularly use the lagoon for foraging and roosting, by increasing foraging habitat in both quantity and quality. **As such, no significant or substantially adverse impacts would result with project implementation (Criterion C).**

As depicted in Table 3.6-8, Alternative 2A would reduce available nesting habitat for Belding's savannah sparrow by 30.4 acres, which equates to a loss of 11 percent compared to existing conditions. The greatest reduction is within the central basin where mid-marsh is being replaced with mudflat and low-marsh habitat. Based on best professional judgment, trends observed in other lagoon restoration projects, and long-term species monitoring programs, Belding's savannah sparrow territory size and density are highly variable and often a reflection of environmental conditions (Zembal et al. 1988). In extreme wet and dry years when habitat is unsuitable for nesting the territories size may be substantially smaller than in moderate years where more area is suitable. Similarly, when restoration efforts at Bolsa Chica reduced available nesting habitat but improved the quality of the available habitat, the population increased and territory sizes reduced resulting in higher densities in remaining habitat (Merkel & Associates

2009). Based on this information, the reduction in nesting habitat for Alternative 2A would not result in a decline in the local population below self-sustaining levels. In addition, the changes to lagoon hydrology would increase the condition of the remaining foraging and nesting habitat suitable for Belding's savannah sparrow. Under current conditions, the frequency and duration of soil saturation in high-marsh habitat is highly variable and is often affected by late season rains and ponding. This results in large fluctuations in the Belding's savannah sparrow population and nesting success each year as they can only nest on dry soil. Improved hydrology would enhance tidal flushing and freshwater export, which would facilitate the drying of high-marsh habitat used for ground nesting. In addition, restoring tidal flushing and salt water exposure to the existing salt marsh habitat in the northeast portion of the lagoon may also improve habitat structure. Although these areas support pickleweed, they are dominated by other native salt marsh species. The presence of these other native salt marsh species makes these areas less preferable for nesting as compared to the dense pickleweed habitat found within the central basin and the western end of the east basin. While the project would result in an overall reduction in available nesting habitat of 11 percent, the improved conditions for the remaining 231 acres (89 percent) of mid- and high-marsh habitat resulting from the restoration, as well as the improved lagoon condition, outweigh the impact associated with the numeric loss of habitat acreage. **The project would ultimately benefit the Belding's savannah sparrow population at San Elijo Lagoon and impacts are considered less than significant and not substantially adverse (Criterion C).**

Light-footed clapper rail nesting and foraging habitat would be modified as part of this alternative. Post-restoration, there would be a net loss of nesting habitat acreage for light-footed clapper rail by 24.8 acres, which equates to a loss of 18 percent when compared to existing conditions. The greatest reduction is within the east basin where brackish marsh would be replaced by subtidal and low-marsh habitat. Although brackish marsh would be reduced, the preferred habitat of clapper rail is low-marsh, which is currently limited in the lagoon. Alternative 2A would result in an increase in the low-marsh from the current 13.3 acres to 23 acres. It should be noted that, although the No Project/No Federal Action Alternative is analyzed separately, low-marsh habitat is expected to continue to expand under existing conditions. This is a result of the now regular maintenance of the lagoon mouth and the artificially established mudflat that currently exists at an unsustainable higher elevation. When the lagoon reaches an equilibrium state, it is predicted that low-marsh would increase to 51 acres compared to existing conditions (13 acres) while brackish marsh would remain unchanged. Although habitat acreage is important to consider when assessing project impacts, it is also important to consider the condition of the impacted habitat. The current and potential future low-marsh habitat occupied by light-footed clapper rail is denoted under existing conditions by the overall poor conditions of the lagoon resulting from poor tidal flushing, and these less than optimal conditions would continue without restoration. The increase in low-marsh habitat expected at equilibrium would

be directly correlated to the net loss of mudflat acreage (63 acres in 2012 versus 29 acres at equilibrium), which is critical foraging habitat for the year-round resident light-footed clapper rail, as well as other foraging birds.

Under Alternative 2A, the expansion of the low-marsh habitat (compared to existing conditions) for light-footed clapper rail would occur in the central and east basins. In addition to affecting habitat acreage, the changes to lagoon hydrology under the alternative would also improve the condition of the remaining foraging and nesting habitat for light-footed clapper rail. Under current conditions, much of the brackish marsh in the east lagoon is inundated with standing, potentially stagnant water. The low-marsh habitat is occupying nutrient-laden sediment which often experiences periods of anoxia. The extension of the tidal prism farther east, in addition to the improved tidal flushing and freshwater export, is expected to enhance the condition of the remaining brackish marsh. Foraging habitat would also be affected by Alternative 2A with a small net increase (3 percent) in acreage but a larger improvement in condition. Clapper rail forage within their nesting habitat in addition to mudflats, mid-marsh, and high-marsh habitats. The regular influx of tidal waters and proper tidal flushing is expected to enhance the benthic community in foraging habitats, but particularly mudflats. The improved conditions for nesting and foraging habitat outweigh the loss of habitat acreage. The net loss of nesting habitat is considered an impact; however, the reduction in nesting habitat would not substantially affect the sustainability of the clapper rail population within the lagoon. Ultimately, the project is expected to benefit light-footed clapper rail populations at San Elijo Lagoon. **Therefore, impacts to light-footed clapper rail with implementation of Alternative 2A are considered less than significant and not substantially adverse (Criterion C).**

As part of the restoration project, there would be long-term monitoring and maintenance. This may include, but is not limited to, biological monitoring, nonnative species treatment, isolated regrading or recontouring, and other adaptive management strategies. Although each of these actions is intended to enhance the success of the restoration effort, there is the potential for impacts to sensitive birds in the lagoon. **As such, long-term monitoring and maintenance is not expected to have a substantial effect on any sensitive species and impacts are considered less than significant and not substantially adverse (Criterion C).**

With implementation of project design features and the net benefits of the restoration project, permanent direct impacts to sensitive species from active conversion of nesting and/or foraging habitat, modified lagoon conditions, and long-term maintenance and operation are considered less than significant and not substantially adverse (Criterion C).

INDIRECT

Indirect long-term/permanent effects include the passive transition of nesting and/or foraging habitat to another habitat type, increased potential for invasive species, and changes to water quality.

Habitat above the high tide line, within the transitional area, may passively transition (change) over a long period of time. The transitional area is considered to begin at the high tide line and extend up to 2+ feet above the high tide line. For Alternative 2A, this area is found between +4.4 feet NGVD and +6.4 feet NGVD. Transitional areas provide refugia opportunity to estuarine-dependent wildlife during extreme high tides and periods of extensive lagoon inundation. As a result of this project, the transitional area would include constructed and existing natural areas. Passive transition of habitat within the new natural transitional area is possible although unpredictable. In particular, these areas are important for Belding's savannah sparrow and light-footed clapper rail as these species are year-round residents that occupy lower-elevation marsh habitat that is regularly affected by tides. In addition, light-footed clapper rail currently occupies and nests in a large portion of brackish marsh in the east basin that would occur within the new natural transitional area. Over time, this area may change from brackish marsh to salt marsh habitat. Although the change in habitat is unpredictable in the transitional area, the connection to tidal hydrology and the improved freshwater export are expected to ultimately enhance the condition of the existing habitat within the east basin transitional area. In addition, impacts to sensitive species resulting from changes to the new transitional area are not considered substantial.

It is possible that reduced periods of saturation and increased salinity may make transitional areas in the east basin more prone to invasion by nonnative species. In particular, areas going through a transition from one habitat type to another may have an increased percentage of bare ground as species die and new recruits arrive. Of particular concern is the salt-tolerant *Tamarix* spp. (tamarisk or salt cedar), which can be highly invasive in estuarine systems and preclude native plant community development. Nonnative invasive species have the potential to exclude native plant recruits and ultimately shape the vegetation community to something less than suitable for estuarine wildlife, including the Belding's savannah sparrow and light-footed clapper rail. As part of the post-construction habitat monitoring and maintenance program for this project, the occurrence of these invasive species would be closely monitored as well as the potential die-off of emergent vegetation (i.e., cattails) in the east basin. Future maintenance would regularly treat invasive species to limit the possibility of invasion. Indirect impacts to sensitive species resulting from invasive species are not considered substantial.

Indirect changes to lagoon condition are expected as a result of restoration and the corresponding improvement to tidal hydrology (e.g., circulation, turnover, freshwater export). Although not quantifiable, these changes are associated with a properly functioning lagoon system with a predominantly open mouth. In particular, changes to water quality are expected including increased oxygenation, reduced or eliminated periods of anoxic conditions, and water temperature regulation. These improvements to water quality and overall lagoon conditions are expected to directly and indirectly benefit sensitive species on-site. The improved conditions would likely result in increased foodweb complexity, including improvements to the terrestrial insect population, the benthic invertebrate population, and the subtidal fish population. All of these communities are primary food sources for various sensitive species and others residing in the lagoon. The indirect improvement to water quality would benefit sensitive species.

With implementation of project design features and the net benefits of the restoration project, indirect permanent impacts to sensitive species from passive transition of nesting and/or foraging habitat and invasive species are considered less than significant and not substantially adverse (Criterion C).

Wildlife Corridors/Connectivity

As described in Section 3.6.1, San Elijo Lagoon is not functioning as a regional corridor. Instead, it is a large area of natural open space connected to Escondido Creek. Escondido Creek links San Elijo Lagoon with other open space habitat in Harmony Grove and the Elfin Forest to the northeast. San Elijo Lagoon is an important natural open space that provides a large area of habitat for core populations of sensitive wildlife and plant species. Alternative 2A would result in temporary and short-term impacts to wildlife movement throughout the lagoon during grading, dredging, and controlled inundation operations. However, construction would be phased and occur within discrete locations at discrete timeframes within the lagoon basins, thereby allowing for wildlife movement within adjacent habitat at any given time during construction.

No long-term impacts are anticipated. The project area would still function as a large area of natural open space that would allow for wildlife movement similar to existing conditions. **Therefore, no significant or substantially adverse short-term or long-term impacts to wildlife movement/connectivity are anticipated with implementation of Alternative 2A (Criterion D)**.

Local Ordinances/Policies/Adopted Plans

Section 3.1 (Land Use) evaluates the project's consistency with local, state, and federal plans. In addition to these land use plans, the project would be required to be consistent with regional

conservation plans. Two regional planning documents cover the San Elijo Lagoon BSA, the draft North County MSCP (County of San Diego 2009) and the North County MHCP (AMEC et al. 2003). The North County MSCP expands the County MSCP into the northwestern unincorporated areas of San Diego County. The portions of the lagoon owned by the County of San Diego (primarily the east basin) are within the North County MSCP area. Portions of the BSA are within conservation areas referred to as the Preserve Area and Pre-Approved Mitigation Area under the draft North County MSCP. The majority of the central and west basins are covered in the MHCP. Both documents allow for restoration of preserve areas. Specifically, the MHCP and the North County MSCP acknowledge the intent for restoration of San Elijo Lagoon (see North County MSCP Section 8.16 and MHCP Section 6.3.5). All restoration, maintenance and monitoring plans prepared for Alternative 2A would be prepared in accordance with the goals of these regional conservation plans, and in consultation with the wildlife agencies. The project is consistent with the goals and objectives of both the MHCP and North County MSCP. **Therefore, no significant or substantially adverse impact would result with implementation of Alternative 2A (Criterion E).**

Alternative 1B

The following section evaluates direct and indirect impacts, as well as permanent and temporary impacts to biological resources associated with Alternative 1B. Minimal discussion is provided where impacts are similar to or less than Alternative 2A. However, if the impact is unique to this alternative or notably different than Alternative 2A, then further discussion is provided.

Sensitive Riparian and Natural Vegetation Communities

Short-term/Temporary

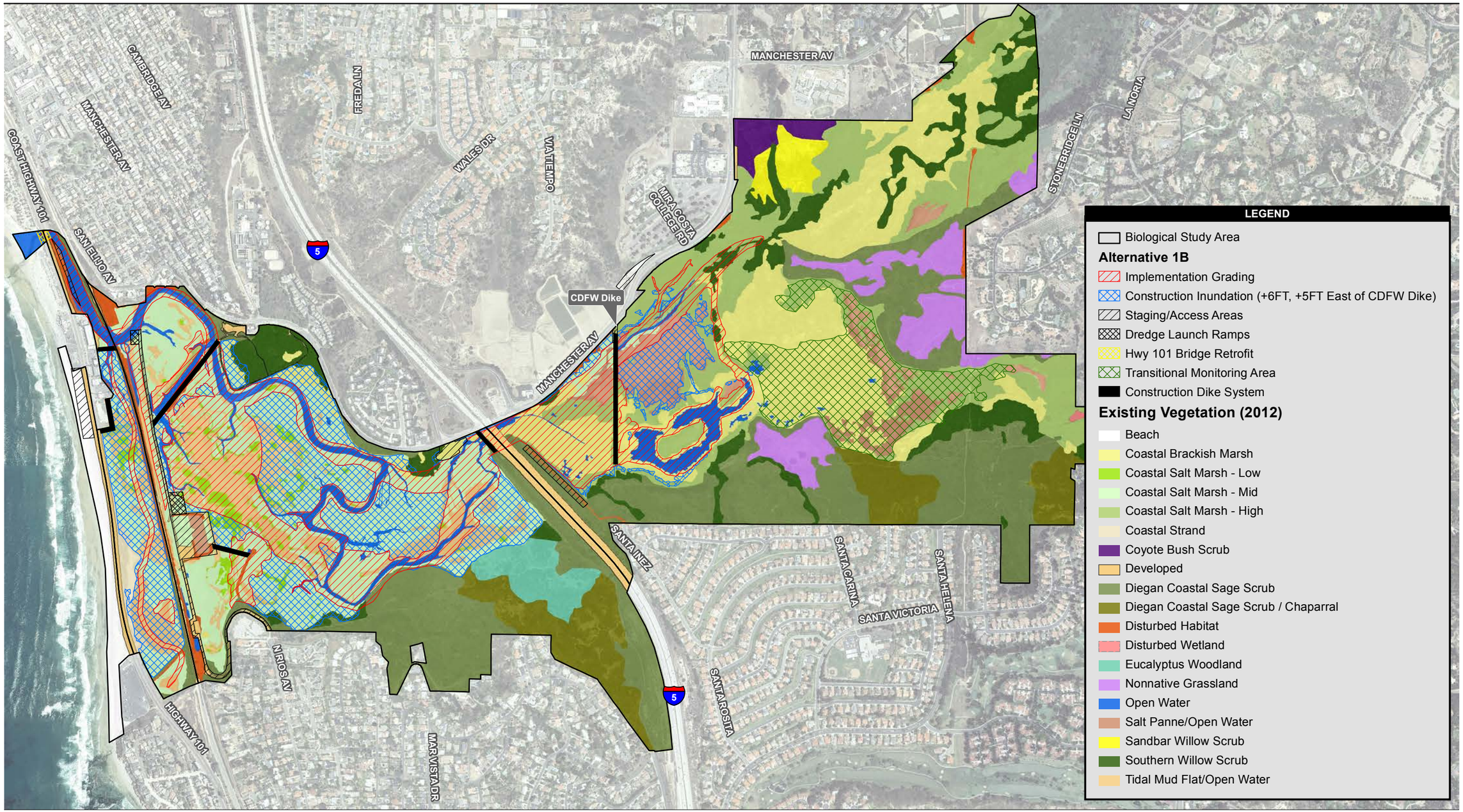
Construction of Alternative 1B would, similar to Alternative 2A, result in temporary or short-term impacts to sensitive habitats associated with grading and dredging operations. The project is anticipated to take approximately 3 years to construct and would be phased to minimize impacts to the lagoon habitats, allowing for refuge and retaining some available habitats at any given time during construction. Inundation durations would be similar to Alternative 2A, as areas proposed for inundation would be inundated for 3 months or longer. Therefore, it is assumed that this vegetation would be substantially impacted and, as a worst-case scenario, it is assumed that vegetation in inundated areas would not survive (i.e., habitat would be lost for more than 12 months). The adaptive management program for the project, as described in Chapter 2.11, includes measures for monitoring and maintenance activities to aid in the recovery of inundated vegetation communities.

Impacts are summarized in Table 3.6-9 and are separated into two types of short-term impacts: areas that would be graded/dredged during construction, and areas that would be affected by inundation only. A complete breakdown of impacts by basin is provided in the BTR included as Appendix F. Impacts associated with Alternative 1B would be similar to the impacts from Alternative 2A, while there would be slightly reduced grading/dredging impacts, and slightly greater inundation impacts. Overall, impacts to the lagoon are similar with approximately 32 percent of the lagoon being impacted by restoration construction. Grading/dredging impacts would occur in approximately 182 acres (approximately 19 percent) of habitat and inundation would impact an additional 130 acres (approximately 13 percent) of habitat within the San Elijo Lagoon BSA (Figure 3.6-12). The extensive hillsides along the lagoon and the eastern end of the BSA would not be impacted by restoration construction.

Table 3.6-9
Direct Project Impacts from Construction of Alternative 1B

Basin/Habitat Community	Existing Vegetation (acres) within the BSA	Alternative 1B Direct Impacts from Dredging/ Grading (acres)	Alternative 1B Direct Impacts from Inundation	Habitat Temporarily Impacted (% in BSA)
Beach	15.0	2.1	0	14%
Coastal Brackish Marsh	131.5	23.9	4.2	21%
Coastal Salt Marsh – High	120.0	12.5	3.3	13%
Coastal Salt Marsh – Low	13.3	6.4	5.8	92%
Coastal Salt Marsh – Mid	141.4	50.6	69.2	85%
Coastal Strand	5.0	0	1.4	28%
Coyote Bush Scrub	7.5	0	0	0%
Developed	23.4	6.0	0.1	26%
Diegan Coastal Sage Scrub	178.2	4.5	0.7	3%
Diegan Coastal Sage Scrub/Chaparral	49.3	0	0	0%
Disturbed Habitat	11.9	2.9	0.8	31%
Disturbed Wetland	1.1	0	0	0%
Eucalyptus Woodland	19.1	0	0.1	1%
Nonnative Grassland	33.1	0	0	0%
Open Water	40.1	31.5	3.0	86%
Salt Panne/Open Water	37.0	6.6	13.7	55%
Sandbar Willow Scrub	8.9	0	0	0%
Southern Willow Scrub	61.3	2.9	2.2	8%
Tidal Mud Flat/Open Water	63.1	32.0	25.2	91%
Total	**960.2**	**181.9**	**129.7**	**32%**

Similar to Alternative 2A, restoration construction would result in greater than 50 percent temporal loss of sensitive habitats that would be significantly impacted by construction including coastal salt marsh (low- and mid-), open water, salt panne/open water, and tidal mudflats. The temporal loss of these habitats may threaten local populations of sensitive resident species, as described further in the Sensitive Species section below. **Short-term direct impacts to coastal**



Source: SANDAG 2012; MoffattNichol; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-12
Alternative 1B Impacts to Vegetation Communities

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salt marsh (low- and mid-), open water, salt panne/open water, and tidal mudflats are therefore considered significant and adverse (Criterion A).

Temporary impacts to beach, coastal brackish marsh, high-coastal salt marsh, coastal strand, Diegan coastal sage scrub, and southern willow scrub are not considered significant because greater than 50 percent of the local habitat would remain available to local resident and migratory species during construction. **Short-term direct impacts to beach, coastal brackish marsh, high-coastal salt marsh, coastal strand, Diegan coastal sage scrub, and southern willow scrub are therefore considered less than significant and not substantially adverse (Criterion A).**

No direct impacts are proposed to coyote bush scrub, Diegan coastal sage scrub/chaparral, disturbed wetland, nonnative grassland, and sandbar willow scrub.

USFWS Critical Habitat

Impacts to USFWS critical habitat and the associated PCEs for western snowy plover would be similar to Alternative 2A. As with Alternative 2A, temporary impacts to critical habitat and the associated PCEs, for the purpose of restoration, would be considered less than significant.

Similar to Alternative 2A, no new impacts to coastal California gnatcatcher critical habitat would result from restoration construction. **Therefore, impacts would be considered less than significant and not substantially adverse (Criterion A).**

Essential Fish Habitat

Construction of Alternative 1B would result in similar temporary and short-term impacts to EFH associated with grading and dredging operations as discussed under Alternative 2A. **No significant or substantially adverse impacts to EFH are anticipated with implementation of Alternative 1B (Criterion A).**

Indirect Impacts

Short-term indirect impacts associated with Alternative 1B would be similar to Alternative 2A. **No significant or substantially adverse indirect impacts to vegetation communities would result with project implementation (Criterion A).**

Long-Term/Permanent

Long-term changes in vegetation (5–10 years post-restoration) would occur from implementation of Alternative 1B, as shown in Table 3.6-6 and Figure 2-8. Within 5–10 years following restoration, habitats are expected to have substantially recovered and matured. The overall acreage of sensitive habitats within the lagoon would remain approximately 960 acres. However, changes to sensitive vegetation in the lagoon would occur with the dredging of channels/basins, grading, and improvements to hydrologic function.

Alternative 1B incorporates hydrologic improvements and proposes additional grading and dredging to further increase tidal influence in the central and east basins while retaining the existing ocean inlet. Major features of Alternative 1B include a matrix of mudflats and secondary channels south of the main channel. Existing emergent low-marsh would be retained (i.e., would not be graded, but would be inundated) to the extent possible to create a diverse habitat distribution in the basin. Based on hydrologic modeling (M&N 2012a), little change would occur in habitat distributions in the east basin under Alternative 1B relative to Alternative 2A, except that, under Alternative 1B, greater low-marsh would be retained at the expense of additional mudflat.

Alternative 1B would result in an increase in subtidal habitat relative to the existing and projected No Project/No Federal Action conditions. Most of the increase in subtidal habitat would occur in the central and east basins and would result in a corresponding decrease in nontidal high-salt marsh, salt panne, freshwater/brackish marsh, and riparian habitats. The open freshwater ponds currently maintained by the CDFW dike would be converted to subtidal habitat. Intertidal mudflat habitat would be increased relative to existing and projected No Project/No Federal Action conditions, with a corresponding decrease in mid-salt marsh. Man-made transition zone habitat would increase through placement of dredged sediments in selected areas of the central and east basins. This increase would result in a corresponding decrease in mid-salt marsh and upland areas.

Alternative 1B would facilitate the efficient conveyance of seasonal freshwater flows through the system to the existing inlet. Similar to Alternative 2A, an avian nesting area located in the central basin would be established. Removal of the CDFW dike under this alternative may restrict management options that would support avian nesting on salt panne habitat in the east basin.

In summary, habitat changes for Alternative 1B trend similarly to Alternative 2A, although the majority of the salt panne and low-marsh habitat is retained, with less mid-marsh and mudflat habitat planned under this alternative. Similar to Alternative 2A, with implementation of Alternative 1B, mudflat, open water, and created transitional habitats would substantially

increase. Under Alternative 1B, salt marsh, freshwater/brackish marsh, and riparian habitats would be reduced. The overall acreage of habitat available for sensitive species would remain unchanged with this alternative. In addition, habitats that remain unchanged are expected to benefit from the improved hydrologic function of the lagoon. When considering changes to sensitive habitats, a change from one sensitive habitat to another does not necessarily represent a positive or negative impact. Rather, the ecological ramifications of the change on sensitive species and lagoon ecology would be the primary indicators of impact. As described in Chapter 2 and noted above under Alternative 2A, the lagoon habitat is rapidly transitioning over time, with continued loss of mudflat and rapid increase in salt marsh. With rapid transition to salt marsh, there is a reduction in available foraging habitat for sensitive and nonsensitive birds, which has the potential for significant ecological changes in the lagoon and is expected to dramatically change the diversity and density of wildlife that the lagoon is able to continue to support. With implementation of Alternative 1B, the project would result in improved hydrologic function and increased foraging habitat, and would reverse the rapid changes occurring under existing conditions. Species-specific impacts associated with these changes are evaluated below. The substantial change in habitat from one sensitive vegetation community to another sensitive vegetation community does not in itself represent a significant biological impact. **With improved lagoon ecology, increased foraging for species, and no overall loss of lagoon resources, impacts to sensitive vegetation communities with project implementation of Alternative 1B are considered less than significant and not substantially adverse (Criterion A).**

USFWS Critical Habitat

The impacts to USFWS critical habitat would be the same as for Alternative 2A and are therefore considered less than significant and not substantially adverse (Criterion A).

Essential Fish Habitat

Construction of Alternative 1B would result in similar long-term beneficial impacts to EFH as discussed under Alternative 2A. This alternative would create additional acreages of open water, tidal channels, and mudflat habitat, as well as enhance the conditions of existing subtidal habitat by increasing tidal influence within the lagoon. Although less subtidal habitat would be created under this alternative, this additional acreage of habitat would also support local fish populations and benefit EFH within the project area. **No long-term significant or substantially adverse impact to EFH is anticipated with implementation of Alternative 1B (Criterion A).**

Indirect Impacts

Long-term indirect changes to the vegetation communities for Alternative 1B would be similar to those described for Alternative 2A. **Indirect passive/natural transition of habitat is anticipated to be neutral or beneficial to the lagoon, and would be monitored via the project's adaptive management program, as described in Section 2.11. Impacts are therefore considered less than significant and not substantially adverse (Criterion A).**

Jurisdictional Waters and Wetlands

Of the approximately 620 acres of wetlands, approximately 285.8 acres would be directly impacted by construction (159.2 acres from grading/dredging and 126.6 acres from inundation). Of this, approximately 0.28 acre is considered state-only waters, because it represents the riprap bank at the existing inlet to the lagoon. **The short-term and long-term (direct and indirect) impacts resulting from the implementation of Alternative 1B would be similar to those discussed for Alternative 2A and are considered less than significant and not substantially adverse (Criterion B).**

Sensitive Species

Flora

No federally or state-listed rare, threatened, or endangered plant species occur within the areas proposed for restoration. As with Alternative 2A, one federally listed plant species, Del Mar manzanita and one state-listed species, Orcutt's goldenbush, occur in uplands habitat and would not be affected by the proposed project.

Approximately 11 individuals of southwestern spiny rush (CNPS List 4.2) are within the grading limits of Alternative 1B and would be directly impacted. However, this direct impact is not considered significant, due to the several hundred individuals scattered throughout the mid- and high-salt marsh habitats within the lagoon. The large population of southwestern spiny rush is expected to persist within the lagoon, as the majority of the mid- and high-salt marsh habitats would remain intact. **Therefore, no significant or substantially adverse impacts to sensitive plant populations are anticipated with construction of Alternative 1B (Criterion C).**

Fauna

There is the potential for short-term/temporary effects as well as long-term/permanent effects associated with the implementation of Alternative 1B. As with Alternative 2A, these effects would be the result of grading, dredging, and controlled prolonged inundation. These effects may

be considered negative (impact) or positive (benefit). Both are discussed related to the seven state and/or federally listed species as described under Alternative 2A.

SHORT-TERM/TEMPORARY

There is the potential for direct and indirect short-term/temporary changes as a result of Alternative 1B that may affect sensitive species.

DIRECT

Direct short-term/temporary effects may include the short-term loss of nesting and/or foraging habitat as well as noise impacts as a result of construction activities grading, dredging, and controlled prolonged inundation.

Impacts resulting from Alternative 1B are similar to Alternative 2A but to a lesser extent. This alternative was designed to maximize lagoon habitat diversity while minimizing direct impacts to the rapidly expanding low-marsh habitat. As part of the restoration effort, nesting or foraging habitat would be temporarily impacted (i.e., graded, dredged, or inundated) during construction, which may affect listed species that use the lagoon and rely on this habitat. The direct temporary impacts to listed species habitat, including nesting and foraging, are summarized in Table 3.6-10 and, as with Alternative 2A, short-term impacts are separated into two types: areas that would be graded/dredged during construction, and areas that would be affected by controlled inundation only. Although both impacts are direct, the duration of the temporary impacts associated with inundation is less predictable as these vegetation communities are adapted to tolerate long periods of inundation. Phased construction across the three lagoon basins would preserve some habitat areas, allowing for species refugia during construction, and would also restrict vegetation removal activities to outside of the nesting season.

Short-term direct impacts to both least Bell's vireo and southwestern willow flycatcher as a result of Alternative 1B are similar as those described for Alternative 2A. Both species have been observed in low numbers foraging primarily within the southern willow scrub habitat. Construction of Alternative 1A would directly impact 5.1 acres (8 percent) of the southern willow scrub riparian habitat within the lagoon as a result of grading and inundation (Table 3.6-10). As vegetation would be removed outside of the breeding season and both species use the site primarily for foraging during summer months, the short-term impact to 8 percent of the southern willow scrub riparian habitat is not substantial and would not result in a decline in the local population below self-sustaining levels. **Therefore, short-term direct impacts to least Bell's vireo and southwestern willow flycatcher would be less than significant and not substantially adverse (Criterion C).**

Table 3.6-10
Alternative 1B Impacts to Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Grading Direct Impact to Existing Habitat		Inundation Direct Impact to Existing Habitat		Total Direct Impact to Existing Habitat	
				Acres	Percent	Acres	Percent	Total Acres	Total Percent
light-footed clapper rail	Nesting/Foraging	Coastal Brackish Marsh	131.5	23.9	18%	4.2	3%	28.1	21%
		Coastal Salt Marsh – Low	13.3	6.4	48%	5.8	44%	12.2	92%
		Total Nesting	144.8	30.3	21%	10	7%	40.3	28%
	Foraging	Mudflats	63.1	32.1	51%	25.2	40%	57.3	91%
		Coastal Salt Marsh – Mid	141.4	50.7	36%	69.2	49%	119.9	85%
		Coastal Salt Marsh – High	120	12.5	10%	3.3	3%	15.8	13%
		Total Foraging	324.5	95.3	29%	97.7	30%	193.0	59%
California least tern	Nesting	Salt Panne	36.9	6.6	18%	13.7	37%	20.3	55%
		Coastal Strand	5	0	0%	1.4	28%	1.4	28%
		Nesting Area**	0	0	0%	0	0%	0.0	0%
		Total Nesting	41.9	6.6	16%	15.1	36%	21.7	52%
	Foraging	Subtidal/Channels	40.1	31.4	78%	3	7%	34.4	86%
		Beach	15	2.1	0%	0	0%	2.1	14%
		Total Foraging	55.1	31.4	57%	3	5%	34.4	62%
western snowy plover	Nesting	CDFW Dike	0.4	0.4	100%	0	0%	0.4	100%
		Salt Panne	36.9	6.6	18%	13.7	37%	20.3	55%
		Coastal Strand	5	0	0%	1.4	28%	1.4	28%
		Nesting Area**	0	0	0%	0	0%	0.0	0%
		Total Nesting	42.3	7	17%	15.1	36%	22.1	52%
	Foraging	Mudflats	63.1	32.1	51%	25.2	40%	57.3	91%
		Beach	15	2.1	0%	0	0%	2.1	14%
		Total Foraging	78.1	32.1	41%	25.2	32%	57.3	73%

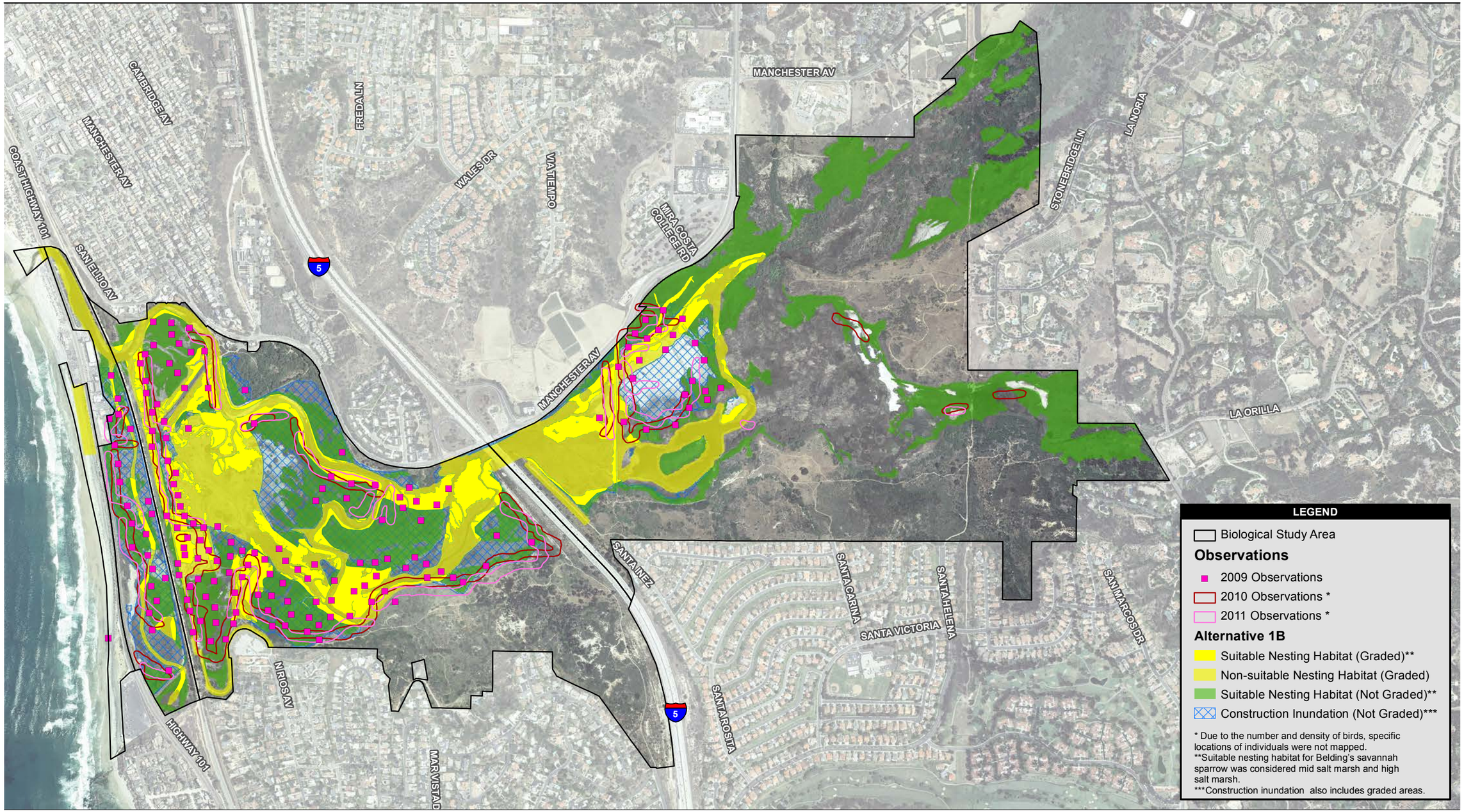
Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Grading Direct Impact to Existing Habitat		Inundation Direct Impact to Existing Habitat		Total Direct Impact to Existing Habitat	
				Acres	Percent	Acres	Percent	Total Acres	Total Percent
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	4.6	3%	0.7	0%	5.3	3%
		Diegan Coastal Sage Scrub/Chaparral	49.3	0	0%	0.03	0%	0.0	0%
		Coyote Bush Scrub	7.5	0	0%	0	0%	0.0	0%
		Total Nesting/Foraging	234.9	4.6	2%	0.73	0%	5.3	2%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	0	0%	0	0%	0.0	0%
		Southern Willow Scrub	61.4	2.9	5%	2.2	4%	5.1	8%
		Total Nesting/Foraging	70.4	2.9	4%	2.2	3%	5.1	7%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	2.9	5%	2.2	4%	5.1	8%
		Total Nesting/Foraging	61.4	2.9	5%	2.2	4%	5.1	8%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	50.7	36%	69.2	49%	119.9	85%
		Coastal Salt Marsh – High	120	12.5	10%	3.3	3%	15.8	13%
		Total Nesting	261.4	63.2	24%	72.5	28%	135.7	52%
	Foraging	Coastal Salt Marsh – Low	13.3	6.4	48%	5.8	44%	12.2	92%
		Total Foraging	13.3	6.4	48%	5.8	44%	12.2	92%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions, a portion of the nesting area is classified as salt panne.

Coastal California gnatcatcher are observed along the periphery of San Elijo Lagoon within the sage scrub and chaparral habitats. As described for Alternative 2A, an access road along the southwest corner of the central basin may need to be enhanced to accommodate construction vehicular traffic for Alternative 1B. In addition, a small foot trail would be temporarily expanded to allow vehicle access to the created transitional habitat and staging area. The intent is to limit road enhancement activities to the existing footprint; however, a conservative analysis of potential impacts has been included. The road and trail enhancement activities are the same for both alternatives. There is the potential to impact nesting coastal California gnatcatcher in this area during vegetation removal. To avoid this potential impact, vegetation would be cleared outside of the bird nesting season. Temporary impacts to gnatcatcher would not result in a decline in the local population below self-sustaining levels. **Therefore, impacts are considered less than significant and not substantially adverse (Criterion C).**

Impacts to both California least tern and western snowy plover are similar to those described for Alternative 2A, including impacts to foraging habitat for both species as a result of grading and habitat conversion (Table 3.6-10). Primary differences include 7 additional acres of temporary impacts on subtidal channels under Alternative 1B relative to Alternative 2A in addition to 2.8 acres of impacts to beach habitat for Alternative 1B. Impacts to foraging habitat would be phased across the three lagoon basins and within each basin, so that large contiguous areas of foraging habitat would remain. Although short-term impacts to foraging habitat would occur, short-term benefits are also expected as lagoon conditions improve. The improved conditions would result in higher productivity in the restored mudflats and subtidal habitat and direct benefits to birds that forage on them, such as the California least tern and western snowy plover. **Therefore impacts are considered less than significant and not substantially adverse (Criterion C).**

Under Alternative 1B, temporary impacts to Belding's savannah sparrow are almost identical to Alternative 2A with impacts to nesting and foraging habitat resulting from dredging and inundation (Figure 3.6-13). Temporary impact acreages are presented in Table 3.6-10. A total of 135.7 acres out of 261.4 acres (52 percent) of suitable nesting habitat for Belding's savannah sparrow would be impacted as a result of construction for Alternative 1B. In addition, 12.2 acres (92 percent) of low-marsh, an important foraging habitat for Belding's savannah sparrow, would be impacted. As with Alternative 2A, Alternative 1B would create noninundated refugia in the west and central basins to maximize available nesting and foraging habitat during construction. It is anticipated that resident Belding's savannah sparrow would respond to the restoration as they do to seasonal variability by shifting and contracting their territory size to accommodate new available acreage. Those birds that do not relocate to the refugia may remain on the perimeter of the lagoon or may choose to leave the lagoon and seek residency elsewhere. The project would minimize impacts by removing vegetation outside of the breeding season, using controlled inundation to move birds out of the work area, and implementing a habitat enhancement plan.



Source: SANDAG 2012; Patton 2010, 2012; AECOM 2014

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Figure 3.6-13
Belding's Savannah Sparrow
Suitable Nesting Habitat Impact Analysis, Alternative 1B

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Belding's savannah sparrow is a year-round resident and project construction would result in the temporary loss of greater than 50 percent of their nesting habitat (mid- and high-salt marsh). This temporary construction impact is considered a significant impact to the local population. **As such, Alternative 1B would have a significant and adverse short-term direct impact on Belding's savannah sparrow (Criterion C).**

Impacts to light-footed clapper rail from Alternative 1B would be similar to Alternative 2A, including direct impacts to 40.3 acres (28 percent) of existing suitable nesting habitat (Table 3.6-10 and Figure 3.6-14). In addition, Alternative 1B would temporarily impact 193 acres (59 percent) of foraging habitat, including mudflats (57.3 acres), mid-marsh (119.9 acres), and high-marsh (15.8 acres). As mentioned above, Alternative 1B was designed to minimize grading impacts to the rapidly expanding low-marsh habitat, which is the preferred nesting habitat of the light-footed clapper rail. The primary impact to low-marsh habitat is a result of the overdredge pit in the central basin, which is needed for soil disposal associated with dredging, as well as the need to conduct controlled inundation to accommodate the dredge. These impacts, in addition to the channel expansion into the east basin, would affect both the low-marsh and brackish marsh habitat that supports light-footed clapper rail. The loss of habitat is an impact; however, it is not considered a substantial impact as the impact is less than 50 percent of the habitat and the remaining habitat can support the existing population of light-footed clapper rail. The project has proposed design features to minimize impacts, including the removal of vegetation outside of the bird breeding season, use of a biological monitor, flushing techniques, and a habitat enhancement plan. **With implementation of project design features and construction monitoring, and because greater than 50 percent of breeding habitat would remain available during construction of the proposed project, short-term direct impacts on light footed clapper rail are considered less than significant and not substantially adverse (Criterion C).**

INDIRECT

Indirect short-term/temporary effects may include increases in exposure to predators, degraded water quality, disturbed unconsolidated sediment, lighting, and noise. These impacts are identical to those described for Alternative 2A.

Species may be exposed to higher predation as they would be more concentrated in the remaining unimpacted habitat, much of which is lower condition. To reduce temporary impacts to marsh birds resulting from the indirect effects of the short-term loss of nesting and foraging habitat, the project has included a variety of design features, including preparation and implementation of a habitat enhancement plan and a predator control program, as described for Alternative 2A.

During construction, sensitive birds using the lagoon may be exposed to degraded water quality resulting from dredging and other sediment-disturbing activities. These impacts are expected to be localized to the active dredge area and are not expected to substantially affect sensitive bird species. In addition, the project would implement BMPs to further reduce water quality impacts and the indirect effects to sensitive birds (see Section 3.4 [Water and Aquatic Sediment Quality]). Dredging activities may also facilitate foraging as benthic organisms are disturbed and released into the water column increasing foraging success for birds.

With implementation of project design features, temporary indirect impacts to sensitive species from predation, water quality, noise, and unconsolidated sediment are considered less than significant and not substantially adverse (Criterion C).

Indirect noise impacts associated with Alternative 1B would be similar to those described in Alternative 2A. The construction (dredging and inundation) footprint for Alternative 1B is similar to Alternative 2A. The total footprint for Alternative 1B is larger than Alternative 2A by 3.2 acres; however, the grading-only footprint is 15.9 acres smaller. The overall construction approach is the same for both alternatives, including the potential use of a diesel dredge and other large construction equipment; as such, temporary impacts from noise to listed species would be similar to impacts previously described. **Similar to Alternative 2A, short-term noise effects on sensitive birds from construction would result in a significant and adverse impact (Criterion C).**

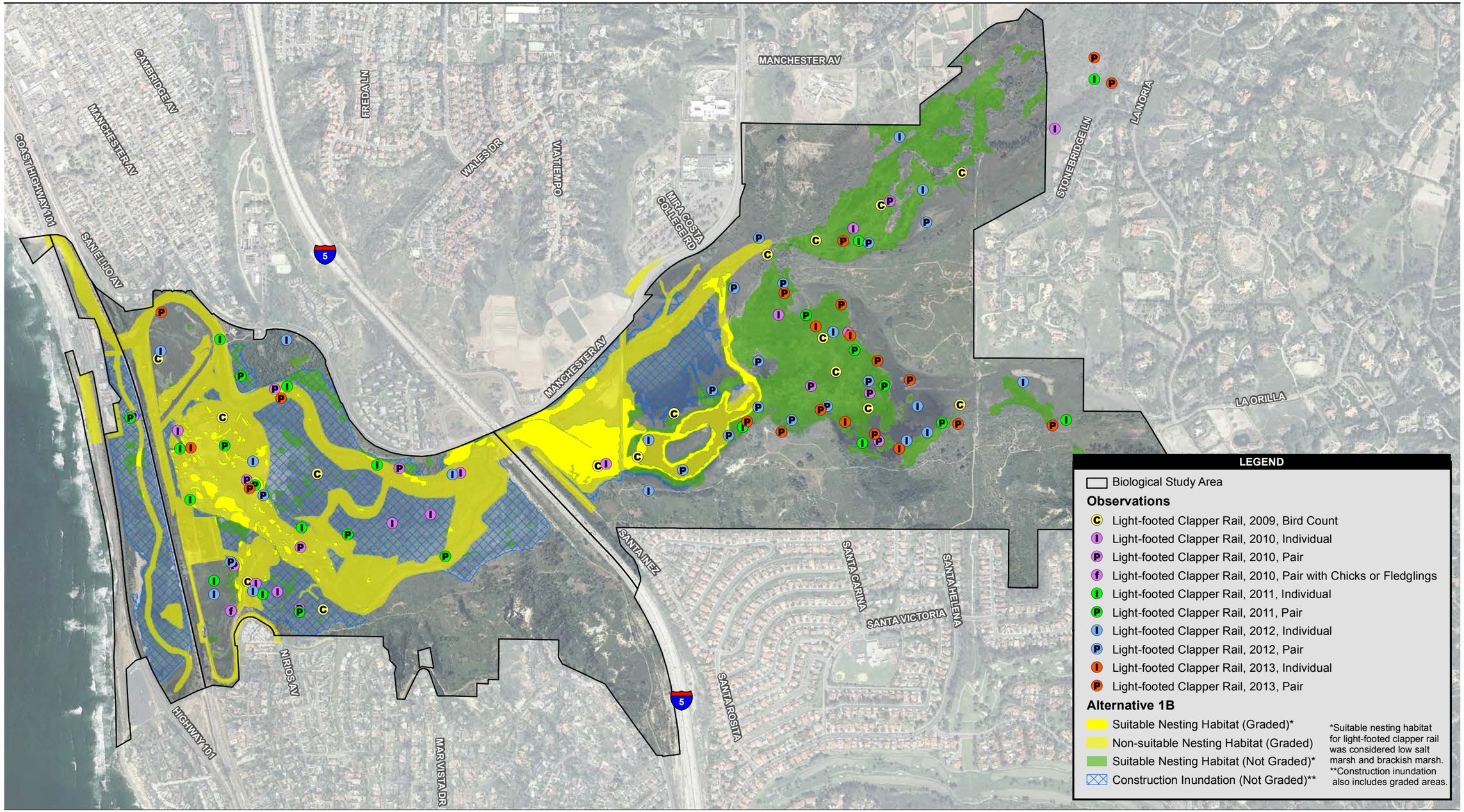
As with Alternative 2A, noise from increased vehicular traffic associated with construction of Alternative 1B may also occur. As with Alternative 2A, one vehicle route coincides with sensitive birds at the southwest entry point in the central basin where vehicles would enter off of North Rios Avenue and travel west into the lagoon. **Noise impacts to birds from vehicular traffic are therefore considered less than significant and not substantially adverse (Criterion C).**

Long-Term/Permanent

DIRECT

Direct long-term/permanent effects include the active conversion of nesting and/or foraging habitat to another habitat type, modified lagoon conditions, and long-term maintenance and operation.

Habitat for sensitive species would be changed and/or converted as a result of the proposed restoration project. This change may include a direct increase or decrease in the total acreage of a



Source: SANDAG 2012; Zembal 2011, 2012; AECOM 2014

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Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-14
Light-footed Clapper Rail
Suitable Nesting Habitat Impact Analysis, Alternative 1B

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specific habitat type post-restoration. This change may be a result of grading or attributed to the modified hydrology and the elevated high tide line. The direct permanent changes to suitable habitat for sensitive species are summarized in Table 3.6-11. Implementation of Alternative 1B would extend tidal hydrology to the east basin and result in a modified high tide line of +3.9 feet NGVD, which is higher than the existing high tide line of +3.5 feet NGVD.

Both least Bell's vireo and southwestern willow flycatcher utilize riparian habitat on-site for foraging habitat. Both species are not known to breed on-site but there is the potential that successful vireo breeding has occurred. As with Alternative 2A, Alternative 1B would actively convert 5 percent of the southern willow scrub habitat and 1 percent of sandbar willow scrub as a result of the expansion of tidal channels in the east basin and widening of tidal channels in the central basin (Table 3.6-11). The loss of 4 percent of riparian habitat is not substantial and would not result in a decline in the local populations of least Bell's vireo and southwestern willow flycatcher below self-sustaining levels. **Therefore, impacts are considered less than significant and not substantially adverse (Criterion C).**

Coastal California gnatcatcher are observed along the periphery of San Elijo Lagoon within the sage scrub and chaparral habitats. Enhancement of the access road off North Rios Avenue could permanently impact 0.7 acre of occupied habitat, although the intent is to conduct activities within the existing road alignment, with the exception of focused widening along the trail to access the created transitional area. This impact, along with the additional 1.2 acres of coastal sage scrub habitat impacted within the lagoon, equates to 1 percent of the total potential nesting habitat on-site. As the gnatcatcher is not occurring at high densities, the loss of 1 percent of their nesting habitat would not preclude the species from nesting as they have historically. Permanent impacts to gnatcatcher habitat associated with the road enhancement and lagoon restoration are not substantial and would not result in a decline in the local population below self-sustaining levels. **Therefore, impacts are considered less than significant and not substantially adverse (Criterion C).**

Both California least tern and western snowy plover are documented annually, foraging and roosting at San Elijo Lagoon. Neither species has successfully nested on-site since 2002. Impacts to suitable nesting habitat from Alternative 1B would be less than Alternative 2A. Primary differences between the alternatives include 13 fewer acres of long-term impacts on salt panne habitat and 7 fewer acres of impact to subtidal/channel habitat under Alternative 1B. Alternative 1B would permanently decrease suitable nesting habitat for California least tern by 4.9 acres (12 percent of suitable nesting habitat) and decrease suitable nesting habitat for western snowy plover by 5.3 acres (13 percent of suitable nesting habitat) (Table 3.6-10). As neither species currently breeds on-site, the loss of nesting habitat does not substantially affect either species. In addition, implementation of a predator control program may also improve conditions of

Table 3.6-11
Alternative 1B Existing and Post-Construction Acreage of Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Habitat Acreage Post-Restoration	Net Change in Habitat Acreage Post-Restoration	Percent Change Post-Restoration
light-footed clapper rail	Nesting/Foraging	Coastal Brackish Marsh	131.5	99	-32.5	-25%
		Coastal Salt Marsh – Low	13.3	51	37.7	283%
		Total Nesting	144.8	150	5.2	4%
	Foraging	Mudflats	63.1	71	7.9	13%
		Coastal Salt Marsh – Mid	141.4	98	-43.4	-31%
		Coastal Salt Marsh – High	120	124	4	3%
		Total Foraging	324.5	293	-31.5	-10%
California least tern	Nesting	Salt Panne	36.9	30	-6.9	-19%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	2	2	200%
		Total Nesting	41.9	37	-4.9	-12%
	Foraging	Subtidal/Channels	40.1	67	26.9	67%
		Beach	15	15	0	0%
		Total Foraging	55.1	82	26.9	49%
western snowy plover	Nesting	CDFW Dike	0.4	0	-0.4	-100%
		Salt Panne	36.9	30	-6.9	-19%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	2	2	200%
		Total Nesting	42.3	37	-5.3	-13%
	Foraging	Mudflats	63.1	71	7.9	13%
		Beach	15	15	0	0%
		Total Foraging	78.1	86	7.9	10%

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Habitat Acreage Post-Restoration	Net Change in Habitat Acreage Post-Restoration	Percent Change Post-Restoration
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	173.5	-4.6	-3%
		Diegan Coastal Sage Scrub/Chaparral	49.3	49.3	0	0%
		Coyote Bush Scrub	7.5	7.5	-0.02	0%
		Total Nesting/Foraging	234.9	230.28	-4.62	-2%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	9	-0.06	-1%
		Southern Willow Scrub	61.4	58.5	-2.9	-5%
		Total Nesting/Foraging	70.4	67.44	-2.96	-4%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	58.5	-2.9	-5%
		Total Nesting/Foraging	61.4	58.5	-2.9	-5%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	98	-43.4	-31%
		Coastal Salt Marsh – High	120	124	4	3%
		Total Nesting	261.4	222	-39.4	-15%
	Foraging	Coastal Salt Marsh – Low	13.3	51	37.7	283%
		Total Foraging	13.3	51	37.7	283%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions, a portion of the nesting area is classified as salt panne.

remaining suitable nesting habitat. Furthermore, both species are expected to benefit from restoration of the lagoon, including increased acreage and improved condition of foraging habitat. Implementation of Alternative 1B would directly benefit these species. **Therefore, no significant or substantially adverse impacts would occur (Criterion C).**

As depicted in Table 3.6-11, Alternative 1B would reduce available nesting habitat for Belding's savannah sparrow by 39.4 acres, which equates to a loss of 15 percent compared to existing conditions. The loss of Belding's nesting habitat associated with Alternative 1B is 9 acres (3 percent) more than Alternative 2A. The greatest reduction in habitat is within the central basin where mid-marsh is being replaced with mudflat habitat. This reduction in nesting habitat would not result in a substantial decline in the local population below self-sustaining levels as Belding's are known to modify their densities and territory size based on natural annual variations in habitat availability as well as improved habitat conditions such as observed at Bolsa Chica (Zembal et al. 1988; CDFG 2010). In addition, the changes to lagoon hydrology would increase the condition of the remaining foraging and nesting habitat suitable for Belding's. While the project would result in an overall reduction in available nesting habitat of 15 percent, the improved conditions for the remaining 222 acres of mid- and high-marsh habitat resulting from the restoration outweigh the impact associated with the loss of habitat acreage. **Implementation of Alternative 1B would ultimately benefit the Belding's savannah sparrow population at San Elijo Lagoon and long-term direct impacts are considered less than significant and not substantially adverse (Criterion C).**

Light-footed clapper rail nesting and foraging habitat would be modified as part of Alternative 1B. Post-restoration, there would be a small gain of nesting habitat acreage for light-footed clapper rail by 5.2 acres, which equates to a gain of 4 percent when compared to existing conditions. This increase in acreage is a combination of change associated with the loss of coastal brackish marsh and the gain of low-marsh. The greatest change is within the east basin where brackish marsh is being replaced by subtidal and low-marsh habitat. Although brackish marsh is being reduced by 32.5 acres (25 percent), the preferred habitat of clapper rail is considered low-marsh, which is currently limited in the lagoon. Alternative 1B would result in an increase in the low-marsh from the current 13.3 acres to 51 acres, an increase of 37.7 acres. Under Alternative 1B, the expansion of preferred habitat (compared to existing conditions) would occur in the central and east basins. In addition to affecting habitat acreage, the changes to lagoon hydrology under Alternative 1B would improve the condition of the remaining foraging and nesting habitat for light-footed clapper rail. Foraging habitat would also be affected by Alternative 1B, with a small net increase in acreage but a larger improvement in condition. The improved conditions for nesting and foraging habitat outweigh the loss of habitat acreage. The net loss of nesting habitat is considered an impact; however, the reduction in nesting habitat would not substantially affect the sustainability of the clapper rail population within the lagoon.

Ultimately, the project would benefit light-footed clapper rail populations at San Elijo Lagoon; therefore, long-term direct impacts are considered less than significant and not substantially adverse (Criterion C).

As part of the restoration project, there would be long-term monitoring and maintenance, which has the potential to impact sensitive birds in the lagoon. **Avoidance measures would be included in the adaptive management program, as described in Section 2.11. As such, long-term monitoring and maintenance is not expected to have a substantial effect on any sensitive species and impacts are considered less than significant and not substantially adverse (Criterion C).**

With implementation of project design features and the net benefits of the restoration project, permanent direct impacts to sensitive species from active conversion of nesting and/or foraging habitat, modified lagoon conditions, and long-term maintenance and operation are considered less than significant and not substantially adverse (Criterion C).

INDIRECT

Indirect long-term/permanent effects include the passive transition of nesting and/or foraging habitat to another habitat type, increased potential for invasive species, and changes to water quality.

Habitat above the high tide line, within the transitional area, may passively transition (change) over a long period of time. The transitional area is considered to begin at the high tide line and extend up to 2+ feet above the high tide line. For Alternative 1B, this area is found between +3.9 feet NGVD and +5.9 feet NGVD. As a result of Alternative 1B, the transitional area would include created and existing natural areas. Passive transition of habitat within the new natural transitional area is possible although unpredictable. Over time, this area may change from brackish marsh and salt panne habitat to salt marsh habitat. Although the change in habitat is unpredictable in the transitional area, the connection to tidal hydrology and the improved freshwater export are expected to ultimately enhance the condition of the existing habitat within the east basin transitional area. **Indirect impacts to sensitive species resulting from changes to the new transitional area are less than significant and not substantially adverse (Criterion C).**

It is possible that reduced periods of saturation and increased salinity may make transitional areas more prone to invasion by nonnative species. As part of the post-construction habitat monitoring and maintenance program for this project, the occurrence of these invasive species would be closely monitored and maintenance would regularly include treatments to limit the

possibility of invasion. Indirect impacts to sensitive species resulting from invasive species are not considered substantial.

As described for Alternative 2A, indirect changes to lagoon condition are expected as a result of Alternative 1B and the corresponding improvement to tidal hydrology (i.e., circulation, turn over, freshwater export, etc.). The indirect improvement to water quality would benefit sensitive species.

With implementation of project design features and the net benefits of the restoration project, indirect permanent impacts to sensitive species from passive transition of nesting and/or foraging habitat and invasive species are considered less than significant and not substantially adverse for Alternative 1B (Criterion C).

Wildlife Corridors/Connectivity

Alternative 1B would have similar temporary and short-term impacts to wildlife corridors and connectivity as discussed under Alternative 2A. The lagoon is not considered a regional wildlife corridor and no long-term impacts are anticipated. The lagoon would still function as a large area of natural open space that would allow for wildlife movement and connectivity similar to existing conditions. **Therefore, no significant or adverse short-term or long-term impacts to wildlife movements or connectivity are anticipated with implementation of Alternative 1B (Criterion D).**

Local Ordinances/Policies/Adopted Plans

Similar to Alternative 2A, restoration, maintenance and monitoring plans prepared for Alternative 1B would be prepared in accordance with the goals of these regional conservation plans, and in consultation with the wildlife agencies. The project is consistent with the goals and objectives of both the MHCP and draft North County MSCP. **Therefore, no significant or substantially adverse impact would result with implementation of Alternative 1B (Criterion E).**

Alternative 1A

Sensitive Riparian and Natural Vegetation Communities

Short-Term/Temporary

Construction of Alternative 1A would result in fewer short-term/temporary impacts to sensitive habitats as compared to Alternative 2A and Alternative 1B. Alternative 1A would be constructed

in a single phase of approximately 9 months and would not involve inundation. The total acreage by habitat community that would be directly impacted during construction is shown in Table 3.6-12. Alternative 1A would result in impacts to approximately 51 acres (approximately 5 percent) of habitat within the BSA (Figure 3.6-15).

Table 3.6-12
Direct Project Impacts from Construction of Alternative 1A

Basin/Habitat Community	Existing Vegetation (acreage) within the BSA	Alternative 1A Direct Impacts from Dredging/ Grading (acres)	Habitat Temporarily Impacted (% in BSA)
Beach	15	2.1	14%
Coastal Brackish Marsh	131.5	4.9	4%
Coastal Salt Marsh – High	120	2.3	2%
Coastal Salt Marsh – Low	13.3	0.3	2%
Coastal Salt Marsh – Mid	141.4	11.4	8%
Coastal Strand	5	0	0%
Coyote Bush Scrub	7.5	0	0%
Developed	23.4	5.3	23%
Diegan Coastal Sage Scrub	178.2	1.9	1%
Diegan Coastal Sage Scrub/Chaparral	49.3	0	0%
Disturbed Habitat	11.9	2	17%
Disturbed Wetland	1.1	0	0%
Eucalyptus Woodland	19.1	0	0%
Nonnative Grassland	33.1	0	0%
Open Water	40.1	15	37%
Salt Panne/Open Water	37	2	5%
Sandbar Willow Scrub	8.9	0	0%
Southern Willow Scrub	61.3	1.4	2%
Tidal Mud Flat/Open Water	63.1	2.3	4%
Grand Total	**960.2**	**50.9**	**5%**

Temporary impacts to habitat communities associated with construction of Alternative 1A are not considered significant or substantially adverse, because greater than 50 percent of the local habitat would remain available to local resident and migratory species during construction (Criterion A).

No direct impacts are proposed to coastal strand, coyote bush scrub, Diegan coastal sage scrub/chaparral, disturbed wetland, eucalyptus woodland, nonnative grassland, and sandbar willow scrub.

USFWS Critical Habitat

Impacts to USFWS critical habitat for western snowy plover would be similar or less than the impacts of Alternative 1B and Alternative 2A. Temporary impacts to critical habitat, for the purpose of restoration, would be considered less than significant. Similar to Alternative 1B and Alternative 2A, no new impacts to coastal California gnatcatcher critical habitat would result from restoration construction. Temporary impacts to western snowy plover critical habitat for Alternative 1A are limited to the east basin, with 5 acres of impacts (ultimately restored). As the critical habitat designation itself for this area is based on future restored conditions, these impacts are considered less than significant. **Therefore, impacts would be considered less than significant and not substantially adverse (Criterion A).**

Essential Fish Habitat

Construction of Alternative 1A would result in similar temporary impacts to EFH associated with grading and dredging operations as discussed for Alternative 2A and Alternative 1B. However, this alternative has the smallest amount of construction proposed; therefore, it would result in fewer temporary impacts to EFH compared to the other alternatives. **No significant or substantially adverse impacts to EFH are anticipated with implementation of Alternative 1A (Criterion A).**

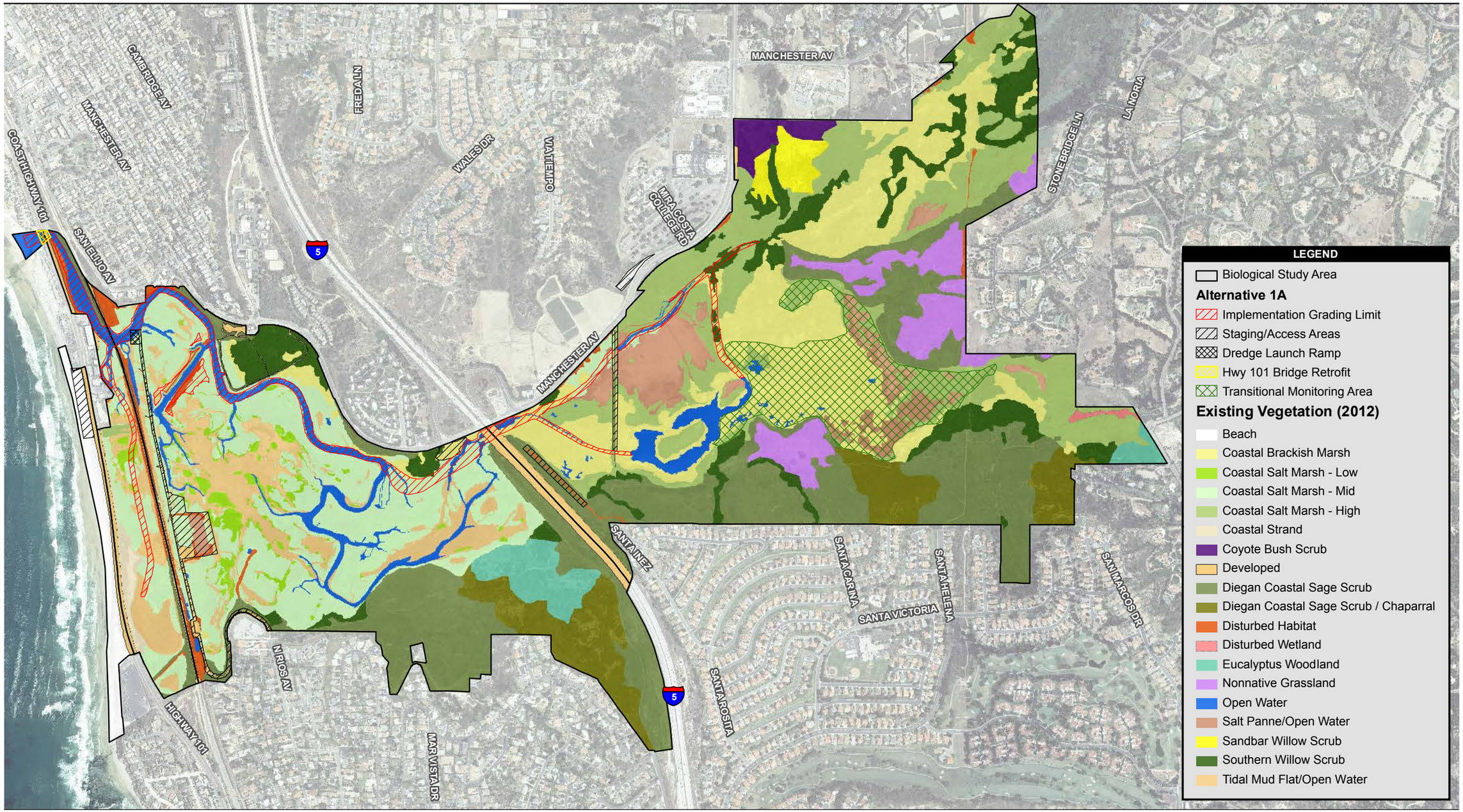
Indirect Impacts

Short-term indirect impacts associated with Alternative 1A would be less than Alternative 2A and Alternative 1B as the total acreage of impact is much smaller relative to the other alternatives. **No significant or substantially adverse indirect impacts to vegetation communities would result with project implementation (Criterion A).**

Long-Term/Permanent

Long-term changes in vegetation (5–10 years post-restoration) would occur from implementation of Alternative 1A, as shown in Table 3.6-6 and Figure 2-9. Within 5–10 years following restoration, habitats are expected to have substantially recovered and matured. The overall acreage of sensitive habitats within the lagoon would remain approximately 960 acres. However, changes between sensitive vegetation communities (e.g. mudflat to low marsh) in the lagoon would occur with dredging, grading, and improvements to hydrologic function.

Alternative 1A proposes modest change to existing conditions within the lagoon. This alternative emphasizes enhancement of existing tidal channels and creation of new tidal channels, providing



Source: SANDAG 2012; MoffattNichol; AECOM 2013

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Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-15
Alternative 1A Impacts to Vegetation Communities

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increased tidal flows in the three lagoon basins. Alternative 1A would use the existing tidal inlet, create a north-south-trending tidal channel in the west basin, create a new channel linking the central basin and the east basin beneath I-5, and enhance existing tidal channels in the east basin.

Retention of the current inlet location combined with minimal grading would result in a slight increase in tidal prism and tidal range compared to existing conditions. This slight increase may result in improved water quality throughout the lagoon, and an increase in the area of tidally influenced habitats. A portion of the central basin currently functioning as intertidal mudflat would continue to transition to mid-salt marsh under this alternative due to relatively high site elevations combined with minimal grading and better tidal drainage, which leads to less frequent tidal inundation of existing mudflats.

Alternative 1A differs substantially from Alternative 1B and Alternative 2A, when comparing changes in habitats over existing conditions. With implementation of Alternative 1A, mudflat and open water/channels/basins would substantially decrease over existing conditions. Creation of transitional habitats would be limited to 2 acres. Under Alternative 1A, salt marsh would substantially increase over existing conditions. Salt panne, freshwater/brackish marsh, and riparian habitats would be negligibly reduced. As with each of the alternatives, the overall acreage of habitat available for sensitive species would remain unchanged with this alternative. In addition, habitats that remain unchanged are expected to benefit from the improved hydrologic function of the lagoon. As described in Chapter 1, the lagoon habitat is rapidly transitioning over time, with continued loss of mudflat and rapid increase in salt marsh. With rapid transition to salt marsh, there is a reduction in available foraging habitat for sensitive and nonsensitive birds, which has the potential for significant ecological changes in the lagoon and is expected to dramatically change the diversity and density of wildlife that the lagoon can continue to support. With implementation of Alternative 1A, the project would result in improved hydrologic function, but it would not increase foraging habitat or reverse the rapid changes that are occurring under existing conditions. Species-specific impacts associated with the changes proposed under Alternative 1A are evaluated below. **With improved lagoon ecology and no overall loss of lagoon resources, impacts to sensitive vegetation communities with project implementation of Alternative 1A are considered less than significant and not substantially adverse (Criterion A).**

Long-term indirect changes to the vegetation communities may occur as a result of restoration activities. Restoration would improve water quality, which is expected to have a positive effect on the lagoon. Less change to vegetation communities is expected under Alternative 1A as compared to Alternative 2A and Alternative 1B. Regardless, changes in habitat are anticipated to be neutral or beneficial to the lagoon and are therefore considered **less than significant and not substantially adverse (Criterion A)**.

USFWS Critical Habitat

No long-term impacts to USFWS critical habitat are anticipated for western snowy plover. The quality of western snowy plover habitat would be improved with the proposed construction of Alternative 1A, as described in the Sensitive Species section, below. No long-term loss of critical habitat is anticipated with project restoration. No new or permanent impacts would occur to coastal California gnatcatcher critical habitat as a result of this project. Impacts associated with the I-5 North Coast Corridor Project would be mitigated via that project. **Therefore, no long-term significant or substantially adverse impacts to USFWS critical habitat are anticipated with implementation of Alternative 1A (Criterion A).**

Essential Fish Habitat

Construction of Alternative 1A would result in similar long-term beneficial impacts to EFH as discussed under Alternative 2A and Alternative 1B. This alternative would create additional acreages of open water, tidal channels, and/or mudflat habitat, as well as enhance conditions of existing subtidal habitat by increasing tidal influence within the lagoon. Although lesser amounts of subtidal habitat would be created under this alternative compared to the other alternatives, this additional acreage of habitat would still benefit EFH. **No long-term significant or substantially adverse impact to EFH is anticipated with implementation of Alternative 1A (Criterion A).**

Jurisdictional Waters and Wetlands

The short-term temporary and long-term permanent impacts resulting from the implementation of Alternative 1A would be smaller than those discussed for Alternative 2A and Alternative 1B, due to the reduction in area impacted by construction under this alternative (Table 3.6-12 and 3.6-11). Of the approximately 620 acres of wetlands, approximately 37.8 acres would be directly impacted by construction.

The amount of jurisdictional waters and wetlands are expected to be similar to existing conditions following implementation of Alternative 1A. However, Alternative 1A would result in up to 2 acres of permanent impacts to jurisdictional waters and wetlands of the U.S. and state due to the construction of the transitional habitat within the central basin. This small amount of permanent loss would be immediately offset by the enhanced wetland conditions and increased diversity of jurisdictional waters and wetlands within the lagoon. For example, the main tidal channel would be extended farther into the east basin, and existing constricted channel connections would be cleared and enlarged allowing for an increase in tidal influence compared to existing conditions. **The short-term and long-term (direct and indirect) impacts resulting**

from the implementation of Alternative 1A would be less than those discussed for Alternative 2A and are considered less than significant (Criterion B).

Sensitive Species

Flora

No federally or state-listed rare, threatened, or endangered plant species occur within the areas proposed for restoration. As with Alternative 2A and Alternative 1B, Del Mar manzanita and Orcutt's goldenbush occur in uplands habitat and would not be affected by the proposed project.

Approximately three individuals of southwestern spiny rush (CNPS List 4.2) are within the grading limits of Alternative 1A and would be directly impacted. As noted in Alternative 2A and Alternative 1B, this direct impact is not considered significant, given that several hundred individuals are scattered throughout the mid- and high-salt marsh habitats within the lagoon. The large population of southwestern spiny rush is expected to persist within the lagoon, as the majority of the mid- and high-salt marsh habitats would remain intact. **Therefore, no significant or substantially adverse impacts to sensitive plant populations are anticipated with construction of Alternative 1A (Criterion C).**

Fauna

There is the potential for both short-term/temporary effects as well as long-term/permanent effects associated with the implementation of Alternative 1A. These effects may be considered negative (impact) or positive (benefit) and both are discussed related to the seven state and/or federally listed species described for Alternative 2A.

SHORT-TERM/TEMPORARY

DIRECT

Direct short-term/temporary effects may include the short-term loss of nesting and/or foraging habitat as well as noise impacts as a result of construction activities.

Impacts resulting from Alternative 1A would be similar in nature to Alternative 2A, but to a much lesser extent. Alternative 1A requires the least grading, with 50.9 acres of the habitat within the 960 acre BSA (5 percent) directly impacted as part of restoration grading activities. This alternative was designed to minimize impacts to existing habitat while increasing tidal circulation to the east basin. As part of the restoration effort, nesting or foraging habitat would be

temporarily impacted (i.e., graded or dredged) during construction, which may affect listed species that use the lagoon and rely on this habitat. Table 3.6-13 presents the temporary impacted acreages and post-restoration acreages of suitable habitat for the evaluated listed species, including nesting and foraging habitat. Unlike Alternative 2A and Alternative 1B, Alternative 1A would not be phased but would occur over a single 9-month time period. Within that single period, construction activities would still be phased so that across the three lagoon basins some habitat areas would be preserved at any given time. This would allow for species refugia during construction. In addition, vegetation removal activities would be restricted to outside of the nesting season.

Short-term direct impacts to both least Bell's vireo and southwestern willow flycatcher as a result of Alternative 1A are less than those described for Alternative 2A and Alternative 1B as long periods of controlled inundation are not required for construction. Both species have been observed in low numbers foraging primarily within the southern willow scrub habitat. Construction of Alternative 1A would directly impact 1.4 acres (2 percent) of the southern willow scrub riparian habitat within the lagoon as a result of grading (Table 3.6-13). As vegetation would be removed outside of the breeding season and both species use the site primarily for foraging during summer months, the short-term impact to 2 percent of the southern willow scrub riparian habitat is not substantial and would not result in a decline in the local population below self-sustaining levels. **Therefore, short-term direct impacts to least Bell's vireo and southwestern willow flycatcher would be less than significant and not substantially adverse (Criterion C).**

Coastal California gnatcatcher are observed along the periphery of San Elijo Lagoon within the sage scrub and chaparral habitats. As described under Alternative 2A, an access road along the southwest corner of the central basin would be improved to accommodate construction vehicular traffic. There is the potential to impact nesting coastal California gnatcatcher in this area during vegetation removal. To avoid this potential impact, vegetation would be cleared outside of the bird nesting season, when birds are highly mobile. A monitor would be used to flush birds out in front of equipment. Temporary impacts to gnatcatcher are not considered substantial and would not result in a decline in the local population below self-sustaining levels. **Therefore, impacts are considered less than significant and not substantially adverse (Criterion C).**

Impacts to both California least tern and western snowy plover are similar to those described for Alternative 2A, including impacts to foraging habitat for both species as a result of grading and habitat conversion (Table 3.6-13). Impacts to potential nesting habitat is minimal with 2 acres of salt panne and a small portion (0.4 acre) of the CDFW dike impacted. Short-term direct impacts would occur on 2 acres of mudflat (foraging habitat for western snowy plover) and 14.3 acres of subtidal/channels (foraging habitat for California least tern). These impacts to foraging habitat

Table 3.6-13
Alternative 1A Impact Acreage of Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Total Acres Existing Habitat Directly Impacted by Grading***	Percent Existing Habitat Directly Impacted
light-footed clapper rail	Nesting	Coastal Brackish Marsh	131.5	4.9	4%
		Coastal Salt Marsh – Low	13.3	0.4	3%
		Total Nesting	144.8	5.3	4%
	Foraging	Mudflats	63.1	2.3	4%
		Coastal Salt Marsh – Mid	141.4	11.4	8%
		Coastal Salt Marsh – High	120	2.3	2%
		Total Foraging	324.5	16	5%
California least tern	Nesting	Salt Panne	36.9	2	5%
		Coastal Strand	5	0	0%
		Nesting Area**	0	0	0%
		Total Nesting	41.9	2	5%
	Foraging	Subtidal/Channels	40.1	14.3	36%
		Beach	15	0	0%
		Total Foraging	55.1	14.3	26%
western snowy plover	Nesting	CDFW Dike	0.4	0.4	100%
		Salt Panne	36.9	2	5%
		Coastal Strand	5	0	0%
		Nesting Area**	0	0	0%
		Total Nesting	42.3	2.4	6%
	Foraging	Mudflats	63.1	2.3	4%
		Beach	15	0	0%
		Total Foraging	78.1	2.3	3%

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Total Acres Existing Habitat Directly Impacted by Grading***	Percent Existing Habitat Directly Impacted
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	1.9	1%
		Diegan Coastal Sage Scrub/Chaparral	49.3	0	0%
		Coyote Bush Scrub	7.5	0	0%
		Total Nesting/Foraging	234.9	1.9	1%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	0	0%
		Southern Willow Scrub	61.4	1.4	2%
		Total Nesting/Foraging	70.4	1.4	2%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	1.4	2%
		Total Nesting/Foraging	61.4	1.4	2%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	11.4	8%
		Coastal Salt Marsh – High	120	2.3	2%
		Total Nesting	261.4	13.7	5%
	Foraging	Coastal Salt Marsh – Low	13.3	0.4	3%
		Total Foraging	13.3	0.4	3%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions a portion of the nesting area is classified as salt panne.
*** Please note that no temporary inundation impacts are associated with Alternative 1A as extensive controlled inundation would not be required.

would be phased across the three lagoon basins, and within each basin, so that contiguous areas of foraging habitat would remain at any given time. Unlike Alternative 2A and Alternative 1B, phasing would occur over a shorter period of time as construction would take 9 months instead of 3 years. Although short-term impacts to foraging habitat would occur, short-term benefits are also expected as lagoon conditions improve. The improved conditions would result in higher productivity in the subtidal habitat and direct benefits to birds that forage on them, such as the California least tern and other diving birds. **Direct short-term/temporary impacts from Alternative 1A to least tern and western snowy plover would be less than significant and not substantially adverse (Criterion C).**

Under Alternative 1A, impacts to Belding's savannah sparrow would be similar to Alternative 2A (although fewer) with direct impacts to nesting and foraging habitat. Impact acreages are presented in Table 3.6-12. Alternative 1A would impact 11.4 acres of mid-marsh and 2.3 acres of high-marsh habitat across the three basins (Figure 3.6-16). A total of 13.7 acres out of 261.4 acres (5 percent) of suitable nesting habitat for Belding's savannah sparrow would be directly impacted. The loss of habitat is an impact; however, it is not considered a substantial impact (i.e., greater than 50 percent of the habitat or greater than 50 percent of the population) to the existing population of Belding's savannah sparrow. The project would further minimize impacts by removing vegetation outside of the breeding season, using a biological monitor to direct construction crews in avoiding/minimizing impacts, and completing habitat enhancement plan (PDF-12, PDF-13, and PDF-20). **Direct short-term/temporary impacts from Alternative 1A to Belding's savannah sparrow would be less than significant and not substantially adverse (Criterion C).**

Short-term/temporary direct impacts to light-footed clapper rail from implementation of Alternative 1A would be similar but substantially less than Alternative 2A, including direct impacts to 5.3 acres (4 percent) of existing suitable nesting habitat (Table 3.6-13 and Figure 3.6-17). These primary direct impacts are associated with the channel widening and the expansion of the channel into the east basin where light-footed clapper rail occupy brackish marsh habitat. The loss of habitat is an impact; however, it is not considered a substantial impact (i.e., greater than 50 percent of the habitat or greater than 50 percent of the population) to the existing population of light-footed clapper rail. The project has proposed design features to minimize impacts, including the removal of vegetation outside of the bird breeding season, use of a biological monitor, and a habitat enhancement plan (PDF-12, PDF-13, and PDF-20). **With implementation of project design features, temporary direct impacts to sensitive species from habitat loss (both nesting and foraging) are considered less than significant and not substantially adverse (Criterion C)**.

INDIRECT

Indirect short-term/temporary effects from Alternative 1A may include degraded water quality, disturbed unconsolidated sediment, lighting, noise, and prolonged inundation. These impacts are similar to those described for Alternative 2A (excluding increased exposure to predators) but to a lesser degree as the footprint is substantially smaller.

During construction, sensitive birds using the lagoon may be exposed to degraded water quality resulting from dredging and other sediment-disturbing activities, as well as night lighting associated with dredge operation. As with Alternative 2A and Alternative 1B, the project would shield lighting away from residents and sensitive habitat areas (PDF-7), and implement BMPs to reduce water quality impacts and the indirect effects to sensitive birds (see Section 3.4 [Water and Aquatic Sediment Quality]). **With implementation of project design features, temporary indirect impacts to sensitive species from water quality, lighting, and inundation are considered less than significant and not substantially adverse (Criterion C).**

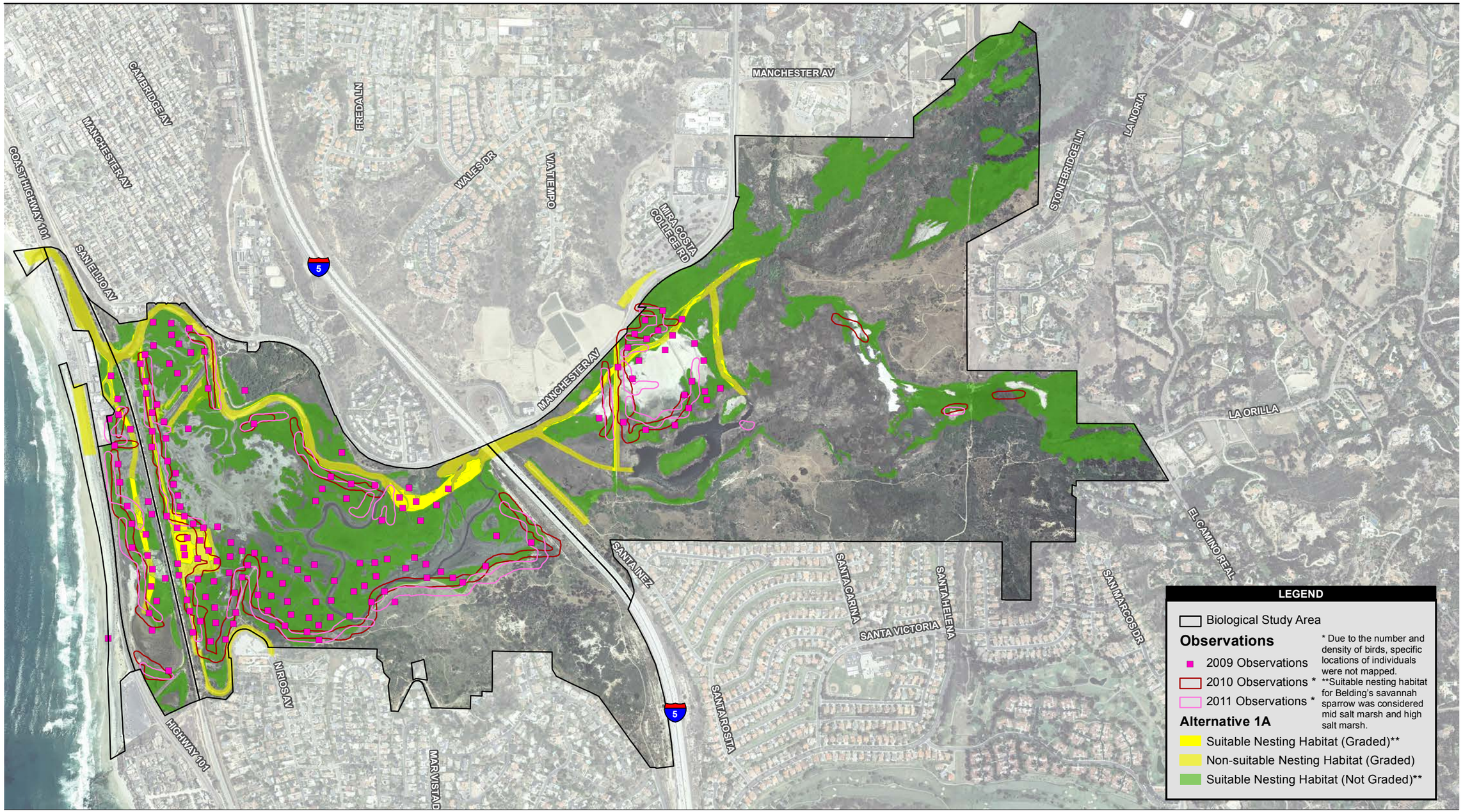
Short-term construction noise could impact sensitive species via the diesel or electric dredge and other large construction equipment. Temporary noise impacts to listed species would be similar to those previously described for Alternative 2A and Alternative 1B. However, under Alternative 1A, no impacts to the east basin would occur, and noise would be limited to the west of I-5. **Temporary indirect impacts associated with construction noise in the west basin are considered significant and substantially adverse (Criterion C).**

As with Alternative 2A, the construction vehicle route at North Rios Avenue would experience increased noise. Two coastal California gnatcatchers have been observed along this existing access route. They are accustomed to vehicular traffic in this area from other maintenance vehicles and as such are not expected to be substantially affected by a minor increase in traffic volume and the associated vehicular noise. **Noise impacts to birds from vehicular traffic are therefore considered less than significant and not substantially adverse (Criterion C).**

LONG-TERM/PERMANENT

DIRECT

Direct long-term/permanent effects include the active conversion of nesting and/or foraging habitat to another habitat type, modified lagoon conditions, and long-term maintenance and operation.



Source: SANDAG 2012; Patton 2011; AECOM 2014

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-16
Belding's Savannah Sparrow
Suitable Nesting Habitat Impact Analysis, Alternative 1A

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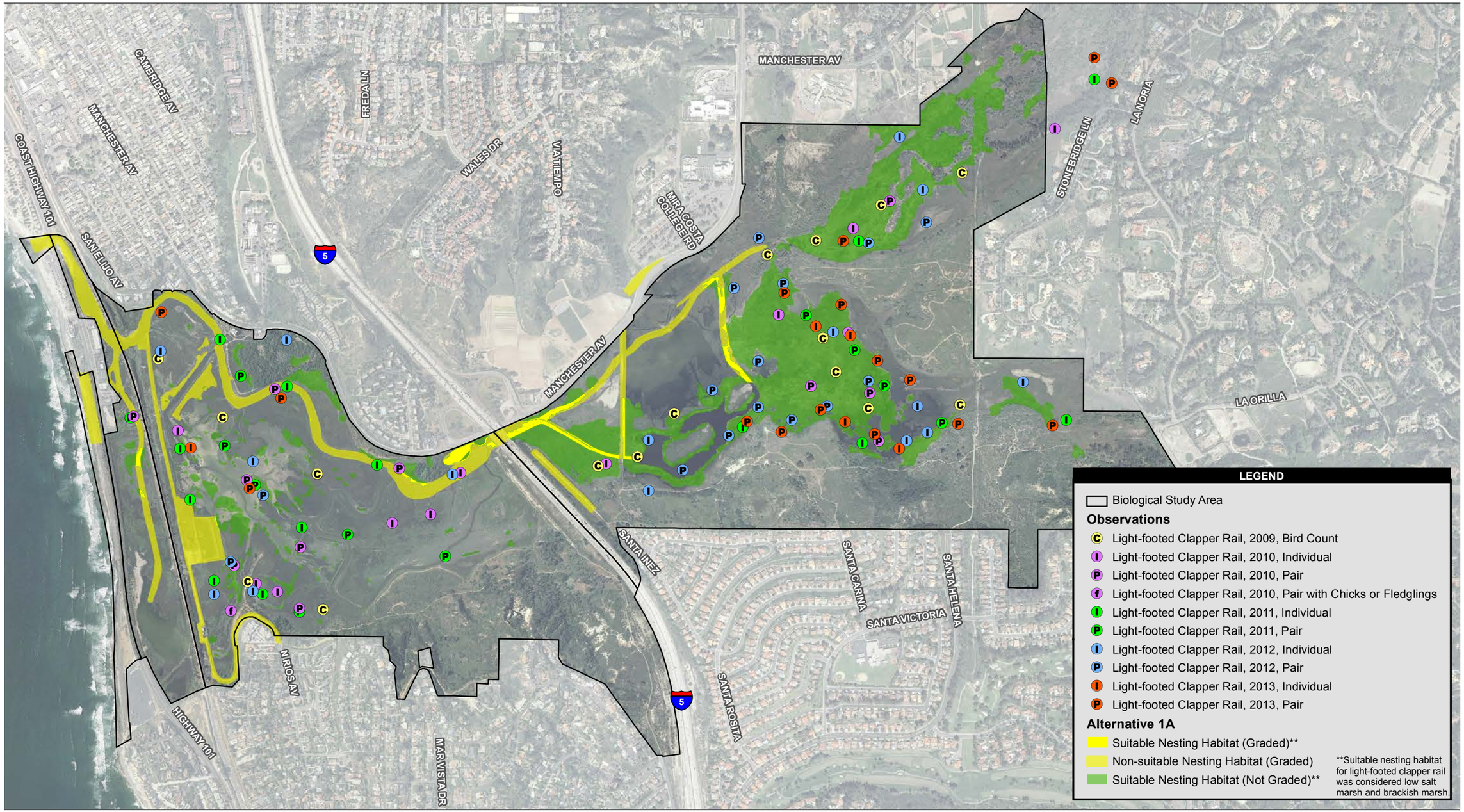

Source: Landiscor 2010; Patton 2012; AECOM 2012

1,100 550 0 1,100 Feet

Scale: 1:13,200; 1 inch = 1,100 feet

Figure 3.6-17
Light-footed Clapper Rail
Suitable Nesting Habitat Impact Analysis, Alternative 1A

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Habitat for sensitive species would be changed and/or converted as a result of this alternative (Table 3.6-14). This change may include a direct increase or decrease in the total acreage of a specific habitat type post-restoration. This change may result from grading, modified hydrology, or elevated high tide line. Implementation of Alternative 1A would extend tidal hydrology to the east basin and result in a modified high tide line of +3.8 feet NGVD, which is moderately higher than the existing high tide line of +3.5 feet NGVD.

Both least Bell's vireo and southwestern willow flycatcher utilize riparian habitat on-site for foraging habitat. Southwestern willow flycatcher are not known to breed on-site. Least Bell's Vireo have not been documented but there is the potential that successful breeding has occurred. Alternative 1A would actively convert 2.7 acres (4 percent) of the riparian habitat within the lagoon BSA as a result of the expansion of tidal channels in the east basin and widening of tidal channels in the central basin (Table 3.6-14). More than enough habitat would remain to support the low numbers of individuals that current migrate into the lagoon. As both species are migratory, occur in low numbers, and have not been confirmed to breed on-site, the loss of 2.7 acres of riparian habitat is not substantial and would not result in a decline in the local populations of least Bell's vireo and southwestern willow flycatcher below self-sustaining levels. **Therefore, impacts to least Bell's vireo and southwestern willow flycatcher are considered less than significant and not substantially adverse (Criterion C).**

Coastal California gnatcatcher are observed along the periphery of San Elijo Lagoon within the sage scrub and chaparral habitats. As with Alternative 2A, the existing access road at North Rios would need to be widened to accommodate construction vehicular traffic. Alternative 1A would permanently impact 0.7 acre of coastal sage scrub habitat with road enhancement in addition to 1.2 acres within the lagoon equating to 1 percent of the total nesting habitat in the BSA. There would still be expansive contiguous undisturbed upland sage habitat along most lagoon hillsides. Permanent impacts to gnatcatcher habitat associated with the road enhancement and lagoon restoration would not be considered substantial because they would not result in a decline in the local population below self-sustaining levels. **Therefore impacts to coastal California gnatcatcher are considered less than significant and not substantially adverse (Criterion C).**

Both California least tern and western snowy plover are documented annually, foraging and roosting at San Elijo Lagoon. Neither species has successfully nested on-site since 2002. Alternative 1A would permanently decrease suitable nesting habitat for California least tern by 2 acres (5 percent of suitable nesting habitat) and decrease suitable nesting habitat for western snowy plover by 2.4 acres (6 percent of suitable nesting habitat) (Table 3.6-14). As neither species currently breeds on-site, the loss of nesting habitat does not substantially affect either

Table 3.6-14
Alternative 1A Existing and Post-Construction Acreage of Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Habitat Acreage Post--Restoration	Net Change in Habitat Acreage Post-Restoration	Percent Change Post-Restoration
light-footed clapper rail	Nesting	Coastal Brackish Marsh	131.5	122	-9.5	-7%
		Coastal Salt Marsh – Low	13.3	44	30.7	231%
		Total Nesting	144.8	166	21.2	15%
	Foraging	Mudflats	63.1	25	-38.1	-60%
		Coastal Salt Marsh – Mid	141.4	140	-1.4	-1%
		Coastal Salt Marsh – High	120	145	25	21%
		Total Foraging	324.5	310	-14.5	-4%
California least tern	Nesting	Salt Panne	36.9	35	-1.9	-5%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	2	2	200%
		Total Nesting	41.9	42	0.1	0%
	Foraging	Subtidal/Channels	40.1	34	-6.1	-15%
		Beach	15	15	0	0%
		Total Foraging	55.1	49	-6.1	-11%
western snowy plover	Nesting	CDFW Dike	0.4	0	-0.4	-100%
		Salt Panne	36.9	35	-1.9	-5%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	2	2	200%
		Total Nesting	42.3	42	-0.3	-1%
	Foraging	Mudflats	63.1	25	-38.1	-60%
		Beach	15	15	0	0%
		Total Foraging	78.1	40	-38.1	-49%

Species	Habitat Suitability*	Habitat Type	Existing Habitat Acres	Habitat Acreage Post--Restoration	Net Change in Habitat Acreage Post-Restoration	Percent Change Post-Restoration
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	178.1	0	0%
		Diegan Coastal Sage Scrub/Chaparral	49.3	49.3	0	0%
		Coyote Bush Scrub	7.5	7.5	0	0%
		Total Nesting/Foraging	234.9	234.9	0	0%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	8.9	-0.06	-1%
		Southern Willow Scrub	61.4	58.8	-2.7	-4%
		Total Nesting/Foraging	70.4	67.7	-2.7	-4%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	58.8	-2.7	-4%
		Total Nesting/Foraging	61.4	58.8	-2.7	-4%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	124	-17.4	-12%
		Coastal Salt Marsh – High	120	145	25	21%
		Total Nesting	261.4	269	7.6	3%
	Foraging	Coastal Salt Marsh – Low	13.3	44	30.7	231%
		Total Foraging	13.3	44	30.7	231%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions, a portion of the nesting area is classified as salt panne.

species. **Therefore, impacts to California least tern and western snowy plover are considered less than significant and not substantially adverse (Criterion C).**

As depicted in Table 3.6-14, Alternative 1A would ultimately increase available nesting habitat for Belding's savannah sparrow by 7.6 acres, which equates to a gain of 5 percent compared to existing conditions. The greatest increase is within the central basin where mid-marsh is being replaced with high-marsh habitat. This increase in nesting habitat would be considered a benefit to the local population. Although there would be an increase in nesting acreage, Alternative 1A would have a minimal effect on lagoon condition and the increased habitat would still be of moderate quality. **Implementation of Alternative 1A would ultimately benefit the Belding's savannah sparrow population at San Elijo Lagoon and no long-term significant or substantially adverse impacts are expected (Criterion C).**

Light-footed clapper rail nesting and foraging habitat would be modified as part of Alternative 1A. Post-restoration there would be a net gain of nesting habitat acreage for light-footed clapper rail by 21.2 acres, which equates to a gain of 15 percent when compared to existing conditions. The greatest increase is within the central basin where mudflat would continue to convert to low-marsh habitat. In the east basin, a portion of the existing brackish marsh (9.5 acres) would also be replaced by subtidal and low-marsh habitat. Although brackish marsh is being reduced, the preferred habitat of clapper rail is low-marsh, which is currently limited in the lagoon. In addition to affecting habitat acreage, the changes to lagoon hydrology under Alternative 1A would improve the condition of the remaining foraging and nesting habitat for light-footed clapper rail. Foraging habitat would have a small net decrease in total acreage (4 percent). This can be deceptive, however, as mudflat, another important foraging habitat, would decrease by 60 percent as a result of the expansion of low-marsh and mid-marsh habitat. The net gain of nesting habitat is considered a benefit; however, the reduction in a preferred foraging habitat (i.e., mudflat) would be a negative impact. Implementation of Alternative 1A would not substantially affect the sustainability of the clapper rail population within the lagoon and, in fact, may ultimately benefit the population if nesting habitat (which would increase) is considered more limiting than foraging habitat (which would decrease). **Therefore, no long-term significant or substantially adverse impacts to light-footed clapper rail would result with implementation of Alternative 1A (Criterion C).**

As part of the implementation of Alternative 1A, there would be long-term monitoring and maintenance, which has the potential to impact sensitive birds in the lagoon. **Avoidance measures would be included in the adaptive management program. As such, long-term monitoring and maintenance is not expected to have a substantial effect on sensitive species and impacts are considered less than significant and not substantially adverse (Criterion C).**

INDIRECT

Indirect long-term/permanent effects include the passive transition of nesting and/or foraging habitat to another habitat type, increased potential for invasive species, and changes to water quality.

Habitat above the high tide line, within the transitional area, may passively transition over a long period of time. The transitional area is considered to begin at the high tide line and extend up to 2+ feet above the high tide line. For Alternative 1A, this area is found between +3.8 feet NGVD and +5.8 feet NGVD. Passive transition of habitat within the new natural transitional area is possible although unpredictable. The greatest passive habitat change would be expected in the east basin where the channel would be expanded and tidal exchange introduced. Over time, this area may change from brackish marsh and salt panne habitat to salt marsh habitat. Indirect impacts to sensitive species resulting from passive unpredictable changes to the new transitional area are not considered substantial.

It is possible that reduced periods of saturation and increased salinity may make transitional areas more prone to invasion by nonnative species. As part of the post-construction habitat monitoring and maintenance program for this project, the occurrence of these invasive species would be closely monitored and maintenance would regularly include treatments to limit the possibility of invasion. Indirect impacts to sensitive species resulting from invasive species are not considered substantial.

As described for Alternative 2A, indirect changes to lagoon condition are expected as a result of Alternative 1A and the corresponding improvement to tidal hydrology (i.e., circulation, turn over, freshwater export, etc.). The magnitude of the improved conditions would be less than under either Alternative 2A or Alternative 1B as the improvement to tidal expression is smaller for Alternative 1A. The indirect improvement to water quality would benefit sensitive species.

With implementation of project design features and the net benefits of the restoration project, indirect permanent impacts to sensitive species from passive transition of nesting and/or foraging habitat and invasive species are considered less than significant and not substantially adverse (Criterion C).

Wildlife Corridors/Connectivity

Alternative 1A would have similar temporary and short-term impacts to wildlife corridors and connectivity as discussed under Alternative 2A and Alternative 1B. However, less construction is proposed under this alternative; therefore, the potential to impede wildlife movement would be

less compared to the other alternatives. No long-term impacts are anticipated; the project area would continue to function not as a regional corridor, but as a large area of natural open space that would allow for wildlife movement and connectivity similar to existing conditions. **Therefore, no significant or substantially adverse impacts to wildlife movements or connectivity are anticipated with implementation of Alternative 1A (Criterion D).**

Local Ordinances/Policies/Adopted Plans

Similar to Alternative 2A, restoration, maintenance, and monitoring plans prepared for Alternative 1A would be prepared in accordance with the goals of these regional conservation plans, and in consultation with the wildlife agencies. The project is consistent with the goals and objectives of both the MHCP and draft North County MSCP. **Therefore, no significant or substantially adverse impact would result with implementation of Alternative 1A (Criterion E).**

No Project/No Federal Action Alternative

This alternative would not directly modify the lagoon, inlet, or Coast Highway 101, although modifications would occur by others to the NCTD Railroad and I-5. As such, temporary construction impacts would not occur. No sensitive plant or animal species detected within the project area would be directly impacted and the amount of jurisdictional waters and wetlands would not change (Criterion B). The project is, however, designed to modify the current trajectory of habitat conversion. Over the past decade, the lagoon has benefited from routine maintenance of the mouth, but it is still operating at a lower condition than possible if tidal expression were improved with restoration. Without restoration, water quality conditions and the wildlife community observed in the lagoon would continue to exist as a mid-level marine system with some diversity and richness. Given the constraints of tidal muting for the lagoon, higher diversity and increased EFH value are not expected without greater tidal expression. Under the No Project/No Federal Action Alternative, habitat conversion is expected to trend toward a more monotypic system.

This section discloses the anticipated habitat types in the future condition (at equilibrium), assuming continued management of the lagoon mouth by SELC. It also addresses how habitat conversion may affect nesting and/or foraging habitat of sensitive animal species (no sensitive plant species would be affected). These changes may be considered negative (impact) or positive (benefit); both are discussed.

Sensitive Vegetation Communities

Long-term changes in vegetation are anticipated to occur as shown in Table 3.6-15 and Figure 3.16-5. Specifically, there would be a substantial reduction in mudflat and open water/tidal channels and basins, with an increase in overall salt marsh habitat, plus increases in low- and high-marsh and a decrease in mid-marsh communities. A rapid conversion of mudflat was observed between 2010 and 2012, with a gain of 13 acres of low-marsh (cordgrass dominated) habitat and a direct loss of mudflat (Figure 2-1). Mudflat is expected to continue to decrease to 29 acres at equilibrium (net loss 34 acres) (Table 3.6-15). This loss of mudflat corresponds to an increase in low-marsh habitat (37.7 acres). In addition, 34.4 acres of mid-marsh habitat would revert to high-marsh habitat (+47 acres) and a portion of the open water on-site would revert to mudflat.

All other habitats and land cover types would remain relatively the same under the No Project/No Federal Action Alternative and the present spectrum of environmental constraints would continue to limit the quality and productivity of the lagoon. The change in habitat from one sensitive vegetation community to another sensitive vegetation community does not, in itself, represent a significant biological impact. However, the No Project/No Federal Action Alternative would not improve lagoon ecology and the lagoon would not benefit from the improved water quality and increased habitat diversity provided by the SELRP. N**o significant or substantially adverse impact would result (Criterion A).**

Rare, Threatened, or Endangered Animal Species

Anticipated habitat conversion would result in a net gain of nesting habitat for both light-footed clapper rail (low-marsh) and Belding's savannah sparrow (high-marsh) but a loss of critical foraging habitat for western snowy plover (mudflat) and least tern (subtidal) in addition to other migratory birds that use the lagoon for foraging habitat. There would be little to no change in habitats that occur above the high tide line; as such, no impacts to coastal California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher are expected under the No Project/No Federal Action Alternative. Changes in marsh habitat from one type to another would benefit some species and impact other species. N**o significant or substantially adverse impact would result (Criterion C).**

Local Ordinances/Policies/Adopted Plans

The MHCP and North County MSCP both refer to the opportunity for restoration at San Elijo Lagoon. While the No Project/No Federal Action Alternative represents a lost opportunity for enhancement to a preserve area designated within these plans, the lack of restoration does not

Table 3.6-15
Existing Habitat and No Project/No Federal Action Habitat Acreage of Suitable Habitat for Listed Bird Species

Species	Habitat Suitability*	Habitat Type	Habitat in Acres			Percent Change
			Existing	No Project/No Federal Action	Net Change	
light-footed clapper rail	Nesting	Coastal Brackish Marsh	131.5	131	-0.5	0%
		Coastal Salt Marsh – Low	13.3	51	37.7	283%
		Total Nesting	144.8	182	37.2	26%
	Foraging	Mudflats	63.1	29	-34.1	-54%
		Coastal Salt Marsh – Mid	141.4	107	-34.4	-24%
		Coastal Salt Marsh – High	120	167	47	39%
		Total Foraging	324.5	303	-21.5	-7%
California least tern	Nesting	Salt Panne	36.9	36.9	0	0%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	0	0	0%
		Total Nesting	41.9	41.9	0	0%
	Foraging	Subtidal/Channels	40.1	24	-16.1	-40%
		Beach	15	15	0	0%
		Total Foraging	55.1	39	-16.1	-29%
western snowy plover	Nesting	CDFW Dike	0.4	0	-0.4	-100%
		Salt Panne	36.9	36.9	0	0%
		Coastal Strand	5	5	0	0%
		Nesting Area**	0	0	0	0%
		Total Nesting	42.3	41.9	-0.4	-1%
	Foraging	Mudflats	63.1	29	-34.1	-54%
		Beach	15	15	0	0%
		Total Foraging	78.1	44	-34.1	-44%

Species	Habitat Suitability*	Habitat Type	Habitat in Acres			Percent Change
			Existing	No Project/No Federal Action	Net Change	
coastal California gnatcatcher	Nesting/Foraging	Diegan Coastal Sage Scrub	178.1	178.1	0	0%
		Diegan Coastal Sage Scrub/Chaparral	49.3	49.3	0	0%
		Coyote Bush Scrub	7.5	7.5	0	0%
		Total Nesting/Foraging	234.9	234.9	0	0%
least Bell's vireo	Nesting/Foraging	Sandbar Willow Scrub	9	9	0	0%
		Southern Willow Scrub	61.4	60.4	-1	-2%
		Total Nesting/Foraging	70.4	69.4	-1	-1%
southwestern willow flycatcher	Nesting/Foraging	Southern Willow Scrub	61.4	60.4	-1	-2%
		Total Nesting/Foraging	61.4	60.4	-1	-2%
Belding's savannah sparrow	Nesting	Coastal Salt Marsh – Mid	141.4	107	-34.4	-24%
		Coastal Salt Marsh – High	120	167	47	39%
		Total Nesting	261.4	274	12.6	5%
	Foraging	Coastal Salt Marsh – Low	13.3	51	37.7	283%
		Total Foraging	13.3	51	37.7	283%

*Nesting habitat is considered suitable for both breeding and foraging activities, while habitat identified as "foraging" is not expected to support breeding activities.
**Under existing conditions, a portion of the nesting area is classified as salt panne.

specifically represent a conflict with these plans. Efforts for preserve management and monitoring would continue consistent with the goals and objectives of these plans. N**o significant or substantially adverse impact would result (Criterion E).**

Materials Disposal/Reuse

Impacts to biological resources from materials disposal/reuse may be direct or indirect. Direct impacts to marine biological resources may occur through burial or smothering of organisms during sand placement at placement sites and stockpile locations, or equipment damage to habitats or animals during construction activities. Indirect impacts may result from decreases in marine water quality associated with sand placement activities, sediment transport from the placement site, noise from construction equipment, or interference of normal movement or behaviors of animals due to construction activities or operational effects. Direct and indirect impacts from the project on biological resources are assessed in this section.

Most effects would be similar regardless of when the project is constructed. However, some effects may vary depending on the time of year of project implementation. This is because certain areas of coastal San Diego are important breeding areas for sensitive species that are managed resources of the state or listed as endangered or threatened species under the state or federal ESAs. Impacts that may vary depending on time of year were considered in this impact assessment.

The impact assessment is organized below according to placement sites. Direct impacts are summarized and then followed by the assessment of indirect impacts. Specific issues associated with threatened and endangered species and EFH are then identified. Beneficial effects are also identified, where appropriate.

Alternative 2A–Proposed Project

Direct Impacts

The primary direct impact associated with beach placement is burial of beach invertebrate animals (e.g., clams, sand crabs, worms) living within the substrate at the placement site. There is the potential to directly impact California grunion individually or their eggs by equipment damage or sand burial, if sand placement or site mobilization activities take place within 10 to 14 days of a spawning run. Other direct impacts may result from equipment damage associated with placement of pipelines to pump sediment to the beaches or offshore sites, operation of vehicles to move and spread sand at the placement sites, and movement of vehicles and equipment during access to and from the placement site. Many of the impacts can be generalized across the project

sites and are not specifically discussed with respect to each site. None of the placement sites are expected to have long-term, significant impacts, as described further below.

Onshore

SAND PLACEMENT

Sand placement for onshore fill could include approximately 90,000 cy of sand material being reused for construction projects near the lagoon, such as infrastructure improvement, NCTD railroad, and Coast Highway 101. A specific project site that would use this material has not yet been identified; therefore, biological impacts resulting from onshore fill would be analyzed during the environmental review process for these specific projects and is not discussed further in this section.

Under sand placement for beach nourishment, large volumes of sand (105,000 to 300,000 cy depending on the placement site) would be placed above and through the intertidal zone that would result in burial impacts to small marine invertebrates (e.g., clams, sand crabs, worms). From the back beach to the top of the slope, where sand depths would be deeper, benthic organisms would be smothered. Organisms also would be buried under decreasing depths of sand toward the toe of the slope. The loss of benthic organisms within the placement site footprint is an expected and unavoidable impact of beach replenishment projects. Most invertebrates within the placement site footprint are not expected to survive, but studies have shown that some mobile animals are able to escape or burrow out from the outer or leading edges of the beach fills where overburden depths are generally 2 feet or less (Lynch 1994, cited in NRC 1995). However, burrowing ability substantially decreases over short time frames (Mauer et al. 1986). Conservative assumptions were used in the impact analysis, with direct impact acreage being calculated as the entire footprint from the back beach to the toe of the slope.

Most studies have reported rapid recovery within 1 year or less for sandy beach intertidal animals after beach nourishment (NRC 1995; Greene 2002; SAIC 2007b). This begins almost immediately after cessation of construction. Recovery occurs via two mechanisms; one is by animals that migrate to the affected area from surrounding habitat, and the second is from recruitment from the plankton. Substantial recovery of invertebrate abundance, species number, and biomass occurred within 4 months after placement of 1 mcy of sand at Imperial Beach (Parr et al. 1998), within a larger area than the SELRP placement sites. Habitat functions were studied for 3 years after the 2001 RBSP at several beach sites in Encinitas, and were found to be enhanced through observations of increased invertebrate prey variety earlier in the season, greater sand depths and grunion habitat suitability, and increased bird use due to wider beach habitat across tide conditions (SAIC 2006). Habitat enhancement also was observed on an

adjacent beach within 1,500 feet downcoast of the Cardiff placement site, although seasonal differences in habitat quality varied more at that site than the placement site.

Sandy beaches normally have higher invertebrate abundance in spring-summer due to recruitment and movement patterns of dominant species between the shallow subtidal and beach habitat. Consequently, the timing of projects may influence the speed of recovery times (reviewed in SAIC 2007b). Invertebrate recovery (e.g., species, abundance, biomass) periods in the order of weeks have been reported with projects completed in winter-early spring prior to the onset of the peak spring-early summer recruitment period. Recovery may take several months if construction is completed in summer-fall, not due to specific project impacts, but because it would be outside of the natural recruitment period. Regardless, recolonization would begin almost immediately and the development of invertebrate prey base would proceed naturally. While rapid recovery is expected for most invertebrates at sandy beaches, recovery rates may be slower for certain long-lived species, if present. For example, rapid recovery rates would not be expected to apply to slow-growing and long-lived species such as Pismo clams, particularly when considering recovery of age structure of populations. However, none of the placement sites support established Pismo clam beds.

California grunions spawn on sandy beaches in the San Diego region between March and August and have the potential to be affected by sand placement, construction activities, and vehicles that have the potential to damage eggs in the upper intertidal, if eggs are present. As part of the project, SELC would implement a pre-construction habitat assessment to determine potential suitability for grunion spawning and implement grunion monitoring during construction. If spawning is observed, the monitor would recommend protective measures, which may include relocation/rescheduling of work/equipment to avoid and minimize adverse effects to this species during their spawning season (PDF-47). Vehicle routes also may need to be specified to minimize impacts if vehicle access to the construction site occurs along the beach. It should be noted that additional or enhanced spawning habitat was provided at several beaches with the 2001 RBSP and 2012 RBSP, and the proposed project has the potential to again enhance or increase persistence of sandy beach habitat at erosive beaches. This would be beneficial for grunion at placement sites where either dense cobble or narrow beach width limits spawning habitat under existing conditions.

A total of 60.9 acres of beach habitat would be disturbed within the onshore areas of the placement sites due to sand placement under Alternative 2A (Table 3.6-16). While impacts would be adverse, the temporary habitat disturbance would not be significant on a regional scale because sandy beach habitat is the dominant shoreline habitat in San Diego County and disturbance of sandy beach habitat functions would be temporary. After construction, sandy beach organisms would begin recolonizing the site almost immediately with recovery anticipated

in relatively short timeframes (within a year) depending on when each site is nourished within the overall construction schedule. Because construction would take about 6 months to complete, placement sites would be in various stages of recovery over the course of the construction period, thereby minimizing potential impacts to other wildlife from temporary reductions in invertebrate prey at individual placement site locations. Direct impacts are summarized for each placement site below.

Table 3.6-16
Estimated Direct Impact Acreage from Sand Placement

Placement Site	Dimensions		Acres	Quantity of Material (cy)
	Length	Width		
Onshore				
Leucadia	2,700	260	16.1	117,000
Moonlight	770	300	5.3	105,000
Cardiff (onshore)	3,400	360	20.8	300,000
Solana Beach	1,900	200	8.7	146,000
Torrey Pines	-	-	10.0	245,000
Total Onshore	**8,770**	**1,120**	**60.9**	**913,000**
Nearshore				
Cardiff (ebb bar)	1,250	1,250	23.4	500,000
Total Impacts	**NA**		**84.3**	**1.4 mcy**

Note: The quantities in this table total more than 1.4 mcy; not all sites may be utilized to the full capacity listed above.

PIPELINE/EQUIPMENT PLACEMENT

Placement of pipelines would occur across the beach face or along the back of the beach. No sensitive habitats occur within the placement sites. Several sites have rocky intertidal or subtidal reef areas in the vicinity, which would be avoided during placement of pipelines. As noted in Table 2-25, a pre-construction survey would be conducted of pipeline routes to ensure no sensitive resources (e.g., hard-bottom habitat) are present within the pipeline alignment (PDF-45). If sensitive resources are present, the pipeline placement would be adjusted to avoid direct impacts. Therefore, no sensitive resources would be directly impacted by the placement. **With this measure, no direct impacts to sensitive habitats or resources would be anticipated (Criterion A).**

Nearshore

SAND PLACEMENT

Approximately 500,000 cy of sand would be discharged nearshore inside the littoral cell at the Cardiff-nearshore site. As presented in Table 3.6-16, a total of 23.4 acres of nearshore habitat would be disturbed. While impacts would be adverse, the temporary habitat disturbance would

not be significant on a regional scale because sandy nearshore habitat is the dominant shoreline habitat in San Diego County and disturbance of sandy nearshore habitat functions would be temporary. Similar direct impacts to invertebrates through burial would occur as described for onshore habitats. In addition, there is a potential for direct impacts to invertebrates and fish species through mortality due to burial by deposited sediment. However, because fish are mobile, mortality rates are expected to be low. In addition, although sea turtles and marine mammals have the potential to use this area, because they are highly mobile it is unlikely they would be directly impacted due to sedimentation. In addition, to further limit potential impacts to marine mammals and turtles a Marine Mammal and Turtle Contingency Plan has been included as a project design feature (PDF-48). The Marine Mammal and Turtle Contingency Plan would be prepared prior to construction to minimize potential interactions between project vessels and protected marine species. A pre-construction contractor training would be conducted by a qualified biologist to educate workers with respect to protected marine species and avoidance measures required by the contingency plan. Monitoring during construction would include marine mammal observers on project vessels who would notify the vessel operator if a protected marine species is in the vicinity.

After construction, invertebrate, fish species, sea turtles, and marine mammals are expected to recolonize or use this site almost immediately. **Therefore, direct impacts associated with sand placement within Cardiff-nearshore placement site is expected to be short term and less than significant. No substantial adverse impacts to habitat/species would occur (Criteria A, C, and D).**

PIPELINE/EQUIPMENT PLACEMENT

Sand placement at the Cardiff nearshore placement site would consist of pipe placement extending from the lagoon mouth along the ocean floor to the proposed placement location. Material excavated from the lagoon would be directly discharged through that pipeline into the nearshore, and the ebb bar constructed from the ocean floor up. Vegetated reefs present on the riprap associated with the San Elijo outfall structure would be avoided during placement of pipelines. A pre-construction survey would be completed for pipeline routes as discussed above to ensure no sensitive resources are directly impacted. **No direct impacts to nearshore resources due to pipeline or equipment placement would occur (Criterion A).**

Offshore

SAND PLACEMENT

Approximately 600,000 cy of sand would be discharged offshore within SO-5/SO-6 placement sites outside of the littoral cell. No sensitive habitat occurs within these placement sites. There is

a potential for direct impacts to invertebrate and fish species due to burial by sediment placement, similar to onshore and nearshore placement sites. Sea turtles and marine mammals have the potential to use these stockpile sites, but because they are highly mobile it is unlikely they would be directly impacted due to sedimentation. Furthermore, a Marine Mammal and Turtle Contingency Plan has been included as a project design feature to further minimize potential impacts (PDF-48). Generally, potential risk for adverse effects is greater in restricted bodies of water such as narrow channels where mobile animals may not be able to avoid discharges or where passive organisms may become concentrated. Such conditions do not apply to open waters and would be expected to contribute to very low mortality rates at the stockpile sites. There would be a temporary reduction in benthic invertebrate biomass and alteration of the benthic community species composition at the stockpile sites associated with the sediment placement. However, after construction, species are expected to recolonize almost immediately. **Therefore, direct impacts associated with offshore sand placement are expected to be short-term and less than significant. No substantial adverse impacts to habitat/species would occur (Criteria A, C, and D).**

PIPELINE/EQUIPMENT PLACEMENT

Placement of sand at offshore sites would use a stable platform, such as a barge. Sand would be pumped from the lagoon through a discharge line to the barge, then through a barge-mounted downspout toward the seafloor. Material would exit the downspout near the seabed and settle out within the stockpile sites. The barge would be repositioned periodically to spread the discharge evenly. No sensitive habitats occur within the SO-5/SO-6 sites; however, they are within the vicinity of rocky and intertidal reef areas. These areas would be directly avoided during placement of pipelines. As noted in Table 2-25, a pre-construction survey would be completed for pipeline routes as discussed above to ensure no sensitive resources are directly impacted. **No direct impacts due to pipeline or equipment placement would occur (Criterion A).**

Indirect Impacts

Indirect impacts to biological resources may occur from turbidity generated during construction, construction noise and activity disturbance, and transport of sand away from the site via natural coastal processes up and down the coast. None of the placement or stockpile sites are predicted to experience long-term, significant impacts.

The following types of indirect impacts may result from sand placement:

- Forage reduction or alteration
- Disturbance, displacement, or interference

- Turbidity
- Sedimentation

In addition, benefits also would occur to sandy habitats after project implementation. Monitoring after the 2001 RBSP demonstrated that beach nourishment enhanced sandy beach habitat functions at several beaches. This was most noticeable at beaches that transitioned from either cobble-covered beaches supporting few biological resources or beaches with highly seasonal periods of productivity coincident with seasonal sand accretion and erosion. The primary benefit was to increase the persistence of sandy beach habitat across seasons such that habitat was suitable early in the season to support the onset of the grunion spawning season and invertebrate recruitment period. This enhancement resulted in increased invertebrate diversity earlier in the season, increased bird use across tide conditions, and enhanced habitat for grunion spawning (e.g., increased beach width and reduction in cobble) (SAIC 2006). Similar beneficial impacts would be anticipated after implementation of SELRP.

Indirect impacts are assessed below in terms of sediment placement at onshore, nearshore, and offshore placement sites. Each type of indirect impact is assessed for habitats, general wildlife, and potential indirect impacts to federally listed or state-listed endangered or threatened species. Many of the impacts caused by onshore placement sites can be generalized across project placement sites and are not specifically discussed with respect to each site. Indirect impacts to nearshore resources due to project sedimentation could have localized effects, however, and are discussed below according to placement site.

Onshore

THREATENED AND ENDANGERED SPECIES

CALIFORNIA LEAST TERN

All placement sites are located at least 0.8 mile away from nesting site locations that may be seasonally used by endangered least terns during their April–September breeding season. The noise levels would not be a disruption to the birds at such a distance. Therefore, indirect impacts due to construction noise would not occur. However, placement of sand at the onshore placement sites would generate turbidity that would be expected to be localized and rapidly dissipate based on the sandy nature of the sediment.

The following sites are located more than 1 mile from least tern nesting sites and would not be expected to affect foraging of the species based on the localized nature of turbidity plumes

expected during construction: Moonlight Beach, Cardiff, Solana Beach, and Torrey Pines (Figures 3-4 and 3-5 included in Appendix H).

The Leucadia placement site is 0.8 mile from the closest nest site and distance increases as one moves along the placement site. Use of training dikes to promote sand deposition and reduction of suspended sediments in return water would reduce turbidity plumes during beach construction (PDF-41). This design feature was found to be effective at reducing turbidity plumes during the 2001 RBSP and ensuring that the project met the USFWS specified environmental conditions of the Biological Opinion Sand placement operations for Alternative 2A, conducted in compliance with permit conditions, would not result in significant impacts to foraging. **With implementation of the described features, the project would not result in significant impacts to California least tern and impacts would not be substantially adverse (Criterion C).**

WESTERN SNOWY PLOVER

The Torrey Pines placement site is located close to critical habitat for western snowy plover. The nearest nests are located at Los Peñasquitos Lagoon and San Dieguito Lagoon. Design features would be used to protect foraging snowy plover, including but not limited to shielding and directing construction lights at the Torrey Pines placement site toward the ocean and away from back beaches (PDF-7), as well as biological monitoring by a qualified biologist to avoid impacts to foraging snowy plover, should they be present during sand placement (PDF-64). Coordination with the contractor would be conducted to schedule construction of the Torrey Pines site outside the breeding season (April 1 through September 15 or after August 1 with confirmation of cessation of nesting) and to ensure no sand is placed within designated or proposed critical habitat to minimize potential impacts to western snowy plover. **With implementation of the described features, the project would not result in significant impacts to western snowy plover and no substantial adverse impacts would occur (Criterion C).**

FORAGE REDUCTION, ALTERATION, OR MODIFICATION

There is potential for indirect effects to shorebird foraging from burial of invertebrates within the footprint of the placement sites. **This impact would not be substantially adverse and would remain less than significant (Criterion D)** since each placement site has unaffected shoreline nearby and recolonization of the placement site by invertebrates would be rapid (e.g., weeks to months).

Temporary attraction of birds, particularly gulls, to the discharge location is anticipated based on observations from a variety of beach nourishment projects. The birds are attracted to the sand-

slurry pumped onto the beach or its return water, where they opportunistically forage on dead invertebrates and organic debris originating from the dredged site. Similarly, fish that feed on plankton or small organic particles may be attracted to turbidity plumes associated with sediment dispersal, presumably to feed on discharged organic particulates. Fish-feeding birds may be attracted in turn to an increased concentration of fish where water clarity is sufficient for them to locate their prey. **Such effects are temporary, not substantially adverse, and less than significant (Criterion D)**.

No adverse effects on seabird or waterbird foraging were observed with implementation of the 2001 RBSP (AMEC 2002). Bird surveys were not specifically conducted for the 2012 RBSP within the areas of the placement sites. However, biological monitors present noted no obvious effects of discharge turbidity on bird foraging behavior or locations. Because turbidity plumes are expected to be similar to the 2001 and 2012 RBSPs, **project-related effects on seabird and waterbird foraging are expected to not be substantially adverse and to remain less than significant (Criterion D)**.

DISTURBANCE, DISPLACEMENT, OR INTERFERENCE

Equipment operation noise and activities have the potential to disturb shorebirds, gulls, and other coastal birds that may forage or rest on beaches at or near placement sites. **This impact would not be significant because disturbance effects would be temporary and limited to the period of construction, unaffected shoreline occurs adjacent to each placement site that provides foraging opportunities, and the forage base at the placement site would rapidly recover. No substantial adverse impacts would occur (Criterion D).**

Artificial night lighting has the potential to disturb or attract wildlife. Grunion have been documented to spawn in the vicinity of beach disposal operations, including the 2001 RBSP. Some reports suggest that grunion spawning may be less in well-lighted areas, while other reports document spawning near lighted areas such as piers. It is not well understood to what extent grunion may be attracted or displaced from spawning at a beach from artificial lighting or other equipment-related disturbance. **Lighting impacts to grunion would be less than significant because habitat suitability assessments, monitoring during construction, and avoidance/minimization of spawning grunion would be used to minimize impacts to the species. No substantial adverse impacts would occur (Criterion D).**

TURBIDITY

Turbidity has the potential to indirectly impact plankton, fish, marine mammals, kelp, and vegetated reefs. Turbidity within the ocean environment is naturally variable depending on wave

climate and season. Monitoring data from seven California beach nourishment projects indicate that turbidity measurements with a nephelometer (nephelometric turbidity units [NTUs]) were below or within ranges measured during storm or high wave conditions (SAIC 2007b). Turbidity would be expected to be localized to the discharge location, generally within 500 feet or less. Plumes would be expected to be largely confined within the surf zone but may be incorporated by rip currents and carried farther offshore. Because sediments are sandy with relatively large average grain size, project-related turbidity would quickly settle and plumes would be temporary.

Most placement sites would be constructed within 10 to 15 days. Therefore, exposure durations to elevated turbidity at any particular reef or other nearshore location generally would be on the order of days to a week. Exposure durations would be substantially less (e.g., minutes, hours) for mobile organisms.

Turbidity would be minimized by the construction of training dikes that would promote settlement of sediment on the beach and lower the amount of suspended sediment within return waters (PDF-41). This design feature was implemented during the 2001 and 2012 RBSPs and found to be effective for minimizing turbidity plumes at the placement sites. With this feature, suspended sediment concentrations would be reduced, thereby minimizing potential effects associated with the range of exposure durations that may occur depending on equipment type and differences in placement site configurations.

The effects of suspended particulates on plankton are generally considered negligible because of the limited area affected and short exposure time as they drift through the affected areas. Similarly, effects on fish would be limited and temporary in nature, and a number of studies have documented variable responses by fish that range from attraction to avoidance. Pelagic fish offshore of the placement sites, and marine mammals that ventured close to shore, would not be expected to be adversely affected because the turbidity would remain localized and short term, and similar to conditions that may be experienced during storm events. No significant impacts are anticipated to plankton, fish, or marine mammals as a result of turbidity.

Kelp beds occur from approximately 850 to 5,000 feet offshore of the placement sites, which is outside the distance that turbidity plumes would be expected to travel offshore unless carried by rip currents. Kelp beds are known to be adversely affected by turbidity when large amounts of shifting sediment bury small plants and prevent settling of microscopic spores, thereby reducing kelp beds. In the unlikely event that turbidity did extend offshore, the particulate concentration would be expected to be low and therefore is not expected to bury small plants and/or prevent settling of microscopic spores resulting in only negligible effects on the kelp bed. **Therefore, no significant impacts are anticipated to kelp beds as a result of turbidity, and no substantial adverse impacts would occur (Criteria A and D).**

Nearshore vegetated reefs have the potential to be impacted by reduced light transmittance and siltation associated with turbidity plumes. Turbidity also has the potential to cause physiological stress, reduced feeding, or displacement of mobile marine invertebrates or fish in reef areas. Actual effects would depend on the concentration and duration of turbidity. While marine invertebrates and bottom-associated fish are generally tolerant of high turbidity such as naturally occurs during high wave or storm conditions, adverse effects may result from exposure to very high concentrations or moderate to high concentrations for prolonged periods. As noted, turbidity plumes associated with the project would be relatively small, localized, and of short duration. Furthermore, suspended sediment concentrations in turbidity plumes would be minimized by use of training dikes (PDF-41). **Therefore, turbidity impacts would not be substantially adverse and would be expected to be less than significant on reef habitat and within the distance of the expected turbidity plumes (Criteria A and D).**

SEDIMENTATION

Fill material placed on individual placement sites would eventually be washed by waves and redistributed offshore and alongshore through natural processes. There is the potential for sand introduced into the system to indirectly impact sensitive habitats and resources if sand deposits on those resources occur at sufficient depth and persistence to result in burial or degradation of those resources. To estimate potential impacts to sensitive habitats, a suite of indicator species of relatively higher quality reef habitats has been identified. As defined in Section 3.6.3, sensitive indicator species consist of surfgrass, feather boa kelp, sea fans, sea palms, and giant kelp.

Evaluating potential indirect sedimentation impacts is complex and the impact conclusions must be determined in light of the dynamic ocean system, where seasonal changes in sand elevation naturally occurs, and understanding of the life history of sensitive species and their relative distribution on nearshore reefs. Similar to the 2001 and 2012 RBSPs, coastal numerical and analytical modeling were used to predict the influence of the project on sand elevation in the vicinity of the placement sites over time. The method is described in Appendix H.

Site conditions vary by placement site, and sedimentation would have different effects on each site depending on these conditions. The closest distances to sensitive habitats from placement sites are summarized in Table 3.6-17. The effect of predicted additional sand influence on resources located in proximity to each placement site is discussed in detail below.

Table 3.6-17
Estimated Closest Distances to Hard-Bottom and Vegetated Habitats from the Seaward Boundary of Proposed Placement Site Alternatives (from SANDAG 2011)

Proposed Placement Sites	Distance (feet) From Placement Site to Hard-Bottom or Vegetated Habitats				
	Hard Bottom (2002)	Intertidal Surfgrass (2002)	Subtidal Surfgrass (2002)	Understory Algae (2002)	Kelp Bed (2008)
Leucadia	150	150	150	290	1000
Moonlight Beach	330	3000	500	400	850
Cardiff (beach)	700	1800	1000	1500	1500
Solana Beach	120	1500	240	200	2500
Torrey Pines	150	200	200	1000	>5000

Note: Historical kelp bed represents maximum extent of kelp across multiple years, 1967–2002; Distances are estimates based on placement site footprints, 2002 Habitat Inventory maps, and 2008 kelp cover.

LEUCADIA

The Alternative 2A volume of sand and location of the Leucadia placement site are the same as with the 2001 and 2012 RBSPs. Modeling predictions of persistent sand increase for SELRP are similar to those of the 2012 RBSP. Modeling predicts average increases in sand elevation of 0.5 to 0.6 foot at distances of 400 to 850 feet offshore. No seasonal scour of reef tops with sensitive resources is predicted because reef heights with sensitive indicators predominantly range between 1 and 3 feet. There may be some reduction of low-relief hard-bottom (less than or equal to 0.5 foot) that is seasonally scoured and does not support sensitive habitat indicators; however, this would be expected to be relatively minor given that predominant reef heights in this area exceed 1 foot.

It is anticipated that the impacts of SELRP on the hard-bottom habitat offshore of Leucadia would be less than significant for the following reasons: (1) reef heights extend above the predicted level of seasonal sand elevation increase offshore and downcoast of the placement site, (2) reef conditions in 2009 offshore and downcoast of the placement site appear similar to conditions observed in 2000 indicating that similar sand placement projects (i.e., 2001 RBSP) implemented previously have not resulted in changes, and (3) monitoring after the 2001 RBSP did not detect a substantial change in sedimentation or surfgrass offshore or within 2,700 feet downcoast of the site attributable to the project.

MOONLIGHT BEACH

The Alternative 2A volume of sand and location of the Moonlight Beach placement site are the same as with the 2001 and 2012 RBSPs. Conditions both before and after the 2001 RBSP showed that inshore portions of reefs in the vicinity are sand influenced with limited resource development within 800 to 1,000 feet offshore. Limited impact to reefs is estimated because

predicted seasonal sand level increases are 0.6 foot or less within 800 feet offshore of the site and decrease with increasing distance offshore, and upcoast and downcoast of the site.

Predicted sand level increases are 4 inches or less at downcoast areas (2,500 feet or more) where surfgrass may be exposed during minus tides. That level of increase would have little, if any, effect because surfgrass predominantly occurs on rocks that seasonally extend above the sand surface under existing conditions.

The inshore portion of the reef adjacent to the northern site boundary is sand influenced within 400 to 800 feet offshore under existing conditions. This is likely due to the relatively low reef heights (predominantly 1 foot or less in June 2006) being within the range of historic seasonal sand level changes, which range from 1 to 2 feet extending from the intertidal to within 800 feet offshore. Therefore, sand level increases of 0.6 foot or less would not substantially bury hard-bottom but may contribute to seasonal sand scour of low-lying reef with limited resource development (e.g., turf algae). Those levels would be expected to have a limited effect since reef heights with sensitive indicators predominantly range between 1 and 2 feet.

It is anticipated that the impacts associated with SELRP on the hard-bottom habitat in the vicinity of the Moonlight Beach placement site would be less than significant for the following reasons: (1) reef heights in the vicinity extend above the predicted level of seasonal sand elevation increase, (2) current reef conditions in the vicinity of the placement site appear similar to conditions observed in 2000 before the 2001, and (3) monitoring after the 2001 RBSP in the vicinity did not detect a substantial change in sedimentation or surfgrass attributable to the project.

CARDIFF

The Alternative 2A volume of sand is greater and the footprint of the proposed Cardiff placement site is extended from that utilized for the 2001 RBSP or 2012 RBSP; specifically 300,000 cy instead of just over 100,000 cy. The transition point of greatest sand level change is coincident with a reef located approximately 1,000 feet offshore, suggesting that the reef modifies movement of sand at that location. Modeling predicts average sand level increases up to 1 foot; these increases are within the range of variability of seasonal sand level change and are below the predominant reef heights that support sensitive indicator species on Cardiff, Seaside, and Table Tops reefs.

Intertidal rock is already sand influenced with turf algae or a combination of turf algae and surfgrass under existing conditions, which is consistent with historical sand level changes of 1 to 2 feet in the intertidal. Surfgrass occurs on rock heights of 0 to 2 feet and may be partially buried

in sand under existing conditions. Recent surveys indicate that surfgrass shoots have lengths of more than 2 feet in the low intertidal zone on these reefs; therefore, the small predicted levels of sand increase would not be expected to substantially increase the depth of seasonal sedimentation or partial burial of surfgrass.

It is anticipated that the impacts of SELRP on the hard-bottom habitat in the vicinity of the Cardiff placement site would be less than significant for the following reasons: (1) predicted sand level increases are low and within the range of natural seasonal variability, (2) predominant reef heights with sensitive indicators extend above the predicted level of seasonal sand elevation increase, (3) existing reef conditions in the vicinity of the placement site are similar to conditions observed in 2000 before the 2001 RBSP, and (4) monitoring after the 2001 RBSP reported no substantial change in surfgrass attributed to the project.

SOLANA BEACH

The Alternative 2A volume of sand and location of the Solana Beach placement site are the same as with the 2012 RBSP. Modeling predictions of persistent sand increase for SELRP are within the range predicted for the 2001 RBSP. Modeling predicts seasonal sand level increases of 0.6 to 0.8 foot within 600 feet offshore and generally 0.5 foot or less with increasing distance offshore, and upcoast and downcoast. These levels would be below the reef heights supporting sensitive indicator species. Substantial reef occurs in proximity to the placement site, including Table Tops reef, which extends onto the shore and is a popular tidepool location in northern San Diego County. More scattered rock reef occurs offshore farther south, and a concentrated patch is locally known as Pill Box reef. A substantial reef feature occurs north of San Dieguito Lagoon. Offshore reef heights are variable, ranging from less than 1 to greater than 6 feet, with heights of 1 to 2 feet common, with most ranging higher. Surfgrass dominates inshore portions of reef, and surfgrass and understory algae are common on reef within 1,300 feet offshore. Reef edges and low relief (less than 1 foot) are dominated by turf algae, indicating sand influence. No impacts to offshore kelp beds are suggested by the model results, which predict sand level increases of 0.1 foot or less at distances offshore where kelp beds occur.

Monitoring of the 2001 RBSP detected sedimentation at certain stations off of Solana Beach. No change in surfgrass cover was observed, although localized changes in surfgrass density were reported. Increased sedimentation was noted at some kelp monitoring stations. Kelp cover was low on a regional scale during the monitoring period due to prior El Niño influence. Kelp bed development is greater under existing conditions than prior to or during the 2001 RBSP due to regional recovery following El Niño events. Therefore, effects of the 2001 RBSP appeared localized and not significant.

It is anticipated that the impacts of SELRP on the hard-bottom habitat offshore of Solana Beach would be less than significant because reef heights extend above the predicted level of seasonal sand elevation increase in the vicinity of the placement site. Further, monitoring from the 2001 RBSP identified localized but not significant effects. The proposed placement site volume and location are identical under this alternative.

TORREY PINES

The Alternative 2A volume of sand and location of the Torrey Pines placement site are the same as with the 2001 RBSP. A localized reef outcrop with surfgrass occurs offshore of the placement site. More developed reefs with understory algae and surfgrass are located approximately 1,100 feet downcoast and 1,400 feet upcoast of the site. Kelp bed habitat is nearly 1 mile from the site. Nearshore reef heights of less than 1 foot mainly have turf algae, while higher relief reef, generally ranging from 1 to 3 feet, supports surfgrass and understory algae. Modeling predicts persistent sand level increases on the order of 0.5 to 0.7 foot and seasonal increases of up to 0.8 to 1 foot that would decrease over time and distance from the placement site. Partial sedimentation of reefs may occur but would not be expected to substantially bury reefs with sensitive indicator species.

No monitoring stations were established in the vicinity of the 2001 RBSP receiver site at Torrey Pines. However, intertidal surfgrass was observed in 2000 during minus tide surveys before the 2001 RBSP and was documented in the same locations during the January 2010 intertidal surfgrass survey. Nearshore surveys conducted downcoast of the receiver site in 2009 documented surfgrass in addition to the understory algae that was mapped with the 2002 Nearshore Program Habitat Inventory. Generally, surfgrass occurrence was sparse on reef transects surveyed in 2009.

It is anticipated that the impacts of SELRP on the hard-bottom habitat in the vicinity of the Torrey Pines placement site would be less than significant because (1) reef heights extend above the predicted level of seasonal sand elevation increase upcoast and downcoast of the placement site and (2) reef conditions in 2009 did not indicate substantial sand influenced habitat degradation from the 2001 RBSP.

SUMMARY OF INDIRECT SEDIMENTATION IMPACTS

Beach sand placed on placement sites would eventually be washed by waves and redistributed offshore and alongshore through natural processes. There is the potential for sand introduced into the system to indirectly impact sensitive habitats and resources if sand deposits on those resources occur at sufficient depth and persistence to result in burial or degradation of those

resources. Generally, sedimentation at profiles was less than 1 foot, with the primary exception being in the vicinity of San Elijo. In addition, even when sediment levels exceeded 1 foot, it rarely persisted for more than 1 year.

Results indicated that project-related impacts were several orders of magnitude less than natural variation, suggesting that no impact to sensitive nearshore marine resources are predicted from implementation of Alternative 2A. Therefore, it is concluded that **indirect impacts due to sedimentation would be short term and less than significant. No substantial adverse impacts would occur (Criterion A).**

OTHER CONSTRUCTION ISSUES

Operation of equipment on the beach has the potential to introduce contaminants to the marine environment from minor spills and leaks. The probability of this type of accidental discharge is considered low. The contractor is required to prepare a Spill Prevention, Control and Countermeasure plan for hazardous spill containment (PDF-3). If a spill occurred, the contractor would utilize BMPs outlined in this plan to prevent long-term degradation of water quality. **For these reasons, impacts to biological resources from accidental discharges would be expected to be less than significant. No substantial adverse impacts would occur (Criterion A).**

Nearshore

FORAGE REDUCTION, ALTERATION, OR MODIFICATION

There is potential for indirect effects to marine biota (fish, sea turtles, and marine mammals) and seabird and waterbird foraging due to the turbidity caused by sedimentation. **These effects would be temporary and would be less than significant because turbidity plumes are expected to be localized and short term. No substantial impacts would occur (Criterion D).**

DISTURBANCE, DISPLACEMENT, OR INTERFERENCE

Equipment operation noise and activities have the potential to disturb coastal birds and marine biota (fish, sea turtles, marine mammals) that may forage within this area. **This impact would not be substantially adverse or significant because disturbance effects would be temporary and limited to the period of construction, unaffected areas occurring adjacent to Cardiff-nearshore placement site would still provide foraging opportunities, and the forage base within this site would rapidly recover (Criterion D).**

TURBIDITY

Indirect impacts due to turbidity from the placement of sediment at Cardiff-nearshore would have similar effects to marine invertebrates, plankton, fish species, marine mammals, and vegetated reefs as discussed for onshore placement sites. As noted, turbidity plumes associated with this placement site would be relatively small, localized, and of short duration. **Turbidity impacts would be expected to be less than significant and not substantially adverse on reef habitat and within the distance of the expected turbidity plumes (Criteria A and D).**

SEDIMENTATION

Analytical modeling of the ebb bar indicated there may be an area that measures approximately 2,200 feet alongshore and 1,600 feet cross-shore off Cardiff State Beach that would be affected by increased sedimentation due to sand placement at Cardiff-nearshore. The estimated depth of the sediment within that area would be approximately 3 feet if it were a three-dimension rectangle with no variation. However, it would be more likely that sediment thickness would vary with a maximum thickness in the center and minimum thickness along the edges. For example, the center may be 6 feet thick while the edges may be 0 feet thick. Biological resources that could be affected by the increased sedimentation are those understory and giant kelp plants present on the riprap associated with the San Elijo Outfall. Based on historical kelp canopy cover, up to 6 acres of understory and/or giant kelp plants could be affected. However, impacts to these resources are not included in this analysis since the intent of the riprap is to support and protect the outfall pipe, and it was not created as an artificial reef to enhance biological productivity. In addition, the San Elijo Joint Powers Authority is under permit to maintain and remove kelp plants at this location to ensure the integrity of the riprap is not compromised. **No substantial adverse impacts would occur, and impacts would remain less than significant (Criterion A).**

OTHER CONSTRUCTION ISSUES

The placement of temporary pipelines, anchoring, installation of monobuoys, and vessel transport have the potential to impact sensitive resources. Project permit conditions would include requirements to avoid sensitive resources such as kelp, reefs, and structures such as outfalls. Discharge lines would be placed to prevent vessels from traversing kelp beds and vessel transit corridors also would avoid kelp beds. In addition, an anchor plan would be prepared for each monobuoy to avoid sensitive resources in the area. **Implementation of these design features would minimize potential impacts to below a level of significance, and no substantial adverse impacts would occur (Criterion A).**

Operation of equipment and support vessels has the potential to introduce contaminants to the marine environment from minor spills and leaks. The potential for accidental discharge also could result from collision with or by another vessel. The probability of both types of accidental discharges is considered low. If a spill occurred, the contractor would utilize BMPs to prevent long-term degradation of water quality. For these reasons, **impacts to biological resources from accidental discharges would be expected to be less than significant (Criterion A). No substantial adverse impacts would occur.**

Offshore

FORAGE REDUCTION, ALTERATION, OR MODIFICATION

There is the potential for indirect effects to marine biota foraging due to the turbidity caused by placement of sediment at SO-5/SO-6. **These effects are temporary and would be less than significant because turbidity plumes are expected to be localized and short term. No substantial adverse impacts would occur (Criterion D).**

DISTURBANCE, DISPLACEMENT, OR INTERFERENCE

Equipment operation noise and activities have the potential to disturb coastal birds and marine biota (fish, sea turtles, and marine mammals) that may forage within this area. **This impact would not be significant because disturbance effects would be temporary and limited to the period of construction, unaffected areas occurring adjacent to Cardiff-nearshore placement site would still provide foraging opportunities, and the forage base within this site would rapidly recover. No substantial adverse impacts would occur (Criterion D).**

TURBIDITY

Placement of sediment at SO-5/SO-6 would result in turbidity and disturbance effects with the potential to affect organisms or habitats. However, this would cause temporary and localized turbidity plumes during construction. No long-term reductions in water clarity or quality would be expected. Turbidity can have a number of adverse effects on marine biota. Reduction of water clarity or ambient light levels can impact primary production of plankton, inhibit plant growth or recruitment of plants in vegetated habitats, reduce foraging efficiency of a variety of animals, or cause physiological stress in organisms unable to move from the effects.

The effects of suspended particulates on plankton are generally considered negligible because of the limited area affected and short exposure time as they drift through the affected areas. Similarly, effects on fish would be limited and temporary in nature, and a number of studies have

documented variable responses by fish that range from attraction to avoidance. Pelagic fish offshore of the placement sites, and marine mammals that ventured close to shore, would not be expected to be adversely affected because the turbidity would remain localized and short term, and similar to conditions that may be experienced during storm events. **No substantial adverse or significant impacts are anticipated to plankton, fish, or marine mammals as a result of turbidity (Criteria A and D).**

Kelp beds occur from about 500 feet from the stockpile sites; however, this is outside the distance that turbidity plumes would be expected to travel. In the unlikely event that turbidity did extend to these areas, particulate concentration would be expected to be so low as to have a negligible effect on the kelp bed. Therefore, **no substantial adverse or significant indirect impacts to kelp beds are anticipated from turbidity generated from stockpile site construction (Criterion A).**

Settlement of suspended sediment from turbidity plumes is not anticipated to indirectly impact vegetated reefs or offshore kelp beds due to the distance (500 feet or greater) of these sensitive habitats from the stockpile sites**. No significant or substantially adverse impacts would occur (Criterion A).**

OTHER CONSTRUCTION ISSUES

The placement of temporary pipelines, anchoring, installation of monobuoys, and vessel transport would have similar impacts to offshore habitats as discussed for the Cardiff-nearshore site. **Impacts to biological resources from accidental discharges would be expected to be less than significant (Criterion A). No substantial adverse impacts would occur.**

Essential Fish Habitat

Designated EFH occurs along the nearshore areas adjacent to placement sites and SO-5/SO-6. In addition to EFH designations, certain areas may also be designated as HAPCs (e.g., estuaries, canopy kelp, sea grass, rocky reefs). HAPCs are discrete subsets of EFH that provide important ecological functions or are vulnerable to degradation (Appendix H). As determined by the analysis in the preceding sections, no substantial adverse effects to quality or quantity of EFH are suggested by modeling predictions of sand level changes within 5 years of project implementation. Less than significant impacts to EFH such as water column habitat, benthic habitat at both the placement and stockpile sites, and HAPCs (e.g., estuaries, canopy kelp, sea grass, rocky reefs), are anticipated and would constitute temporary adverse impacts (e.g., temporary turbidity plume due to loss of prey items at placement sites due to nourishment). Similarly, temporary adverse impacts to life stages of managed species are expected to occur as a

result of the project. Protective measures have been implemented to avoid and/or minimize these impacts.

Alternative 1B

Direct Impacts

The area of direct impact to beach habitat and invertebrate resources would be slightly smaller than identified under Alternative 2A due to the smaller amount of material proposed to be deposited onto the Cardiff nearshore placement site. As noted for Alternative 2A, actual impacts to biological resources would be less at some sites as marine invertebrates do not inhabit back beach nontidal areas and some would escape mortality along the constructed slope and leading edge of the fill. A maximum of 78 acres of beach habitat would be disturbed by construction of Alternative 1B (Table 3.6-18). Temporary habitat disturbance would not be significant on a regional basis because sandy beach habitat is the dominant shoreline habitat in San Diego County. Furthermore, construction would be sequential and would affect a single placement site at any one time; therefore, placement sites would be in various stages of recovery over the course of the construction period. Effects of construction on fish and wildlife largely would be localized rather than regional in scope.

Table 3.6-18
Estimated Direct Impact from Sand Placement

Placement Site	Dimensions (feet)		Acres	Quantity of Material (cy)
	Length	Width		
Onshore				
Leucadia	2,700	260	16.1	117,000
Moonlight	770	300	5.3	105,000
Cardiff (onshore)	3,000	360	21.9	300,000
Solana Beach	1,900	200	8.7	146,000
Torrey Pines	-	-	10.0	245,000
Total Onshore	**8,370**	**1,120**	**62.0**	**913,000**
Nearshore				
Cardiff (ebb bar)	1,000	1,000	16.0	300,000
Total Impacts	**9,370**	**2,120**	**78.0**	**1.2 mcy**

Leucadia, Moonlight Beach, Torrey Pines, SO-5/SO-6, Cardiff-onshore, Solana Beach

These placement sites have the same footprint as Alternative 2A and direct effects would be similar to those described for Alternative 2A.

Cardiff-nearshore

The footprint at this placement site would be smaller (approximately 200,000 cy less) than proposed under Alternative 2A; therefore, the nature of the impact would be similar to or less than analyzed in Alternative 2A and **would not constitute a significant impact. Similarly, impacts to grunion would be minimized and would remain less than significant (Criteria A and D). No substantial adverse impacts would occur.**

Indirect Impacts

Indirect impacts associated with Alternative 1B are anticipated to be similar to Alternative 2A, because sand placement occurs within the same footprints as analyzed in Alternative 2A, with the exception of the Cardiff-nearshore site. Under Alternative 1B, less sediment would be discharged within the Cardiff-nearshore site resulting in indirect impacts similar to or less than those analyzed for Alternative 2A. **No substantial adverse impacts would occur, and impacts would be less than significant (Criteria A and D).**

Alternative 1A

Alternative 1A proposes to dispose approximately 160,000 cy of material to the LA-5 offshore disposal site. This site is an approved ocean disposal site designated by EPA in 1987. The direct and indirect biological impacts associated with the disposal of materials at this site were fully evaluated in the 1987 EIS for LA-5. Use of LA-5 would require compliance with the environmental approvals already completed for that site (e.g., through Tier 3 testing and approval from the Corps and EPA). **Therefore, Alternative 1A is not expected to cause additional impacts** than those analyzed in the 1987 EIS **(Criteria A through E).**

Impact Conclusion

The SELRP is, by design, a project for the long-term improvement of water quality and health/diversity of biological resources. Numerous project design features are incorporated into the project to minimize impacts during construction and most potential impacts to biological resources would be less than significant. However, during construction, there would be significant impacts to sensitive vegetation communities and resident marsh birds where temporary loss of habitat would exceed 50 percent. In addition, short-term significant and substantially adverse impacts to birds may result from indirect noise impacts. There would be no long-term significant or substantial adverse impacts; ultimately, the noise levels would reduce to existing levels where these sensitive species are residents, and habitat diversity would facilitate stable populations of these species.

There would be no substantial adverse or significant impacts to marine biological resources.

A summary of lagoon impacts is provided in Table 3.6-19, by alternative. Impacts associated with materials disposal are considered less than significant.

3.6.4 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Lagoon Restoration

A variety of project design features detailed in Chapter 2 would be implemented during construction to avoid and reduce impacts to biological resources, including phasing, clearing and grubbing outside of the breeding season, flooding to prevent impacts to clapper rail, habitat enhancement plans, designated refugia, etc. These features would be required of the project via construction specifications and other agreements. Because this project is a restoration project focused on improving the water quality and biological diversity of the lagoon, substantial time and effort went into the planning for, and avoidance of, short-term and long-term impacts to species and their habitats. Significant short-term impacts to vegetation communities were identified with Alternative 2A and Alternative 1B, due to the loss of over 50 percent of a sensitive habitat community for over 12 months.

A project design feature was considered to reduce short-term impacts to sensitive habitats. This project design feature was rejected, as described below:

Phasing – Consideration was given to phasing the project over a longer period of time to avoid impacting any more than 50 percent of a given habitat type within a basin. However, several challenges were presented with this phasing concept, including (1) the inability to conduct wet construction; (2) substantial earthwork to create "cells" to limit impacts to areas within a given basin; (3) significant increases in the overall length of the project, which could result in greater impacts to habitats and species; and (4) construction costs that could increase substantially. For these reasons, phasing was determined to be more impactful and not preferred.

Significant short-term impacts were identified under Alternative 2A and Alternative 1B to Belding's savannah sparrow, due to the temporary loss of greater than 50 percent of their nesting habitat. Avoidance and minimization measures have been incorporated into the project, including a habitat enhancement plan during construction, refugia, clearing and grubbing outside of the nesting season, etc. Even with implementation of these measures, the temporary loss of habitat may result in a short-term decline in Belding's savannah sparrow. Phasing was considered to reduce this impact, but rejected, as described above. Feasible measures to avoid and minimize impacts have been incorporated into the project. Even with implementation of these measures,

Table 3.6-19
Summary of Impacts to Biological Resources by Alternative

CEQA Threshold of Significance Category			Alternative		
			Alternative 2A	**Alternative 1B**	**Alternative 1A**
Sensitive Riparian and Natural Vegetation Communities	Short Term	Sensitive Riparian and Natural Vegetation Communities	Significant Direct Impact (low- and mid-salt marsh, open water, salt panne, and tidal mudflats)	Significant Direct Impact (low- and mid-salt marsh, open water, salt panne, and tidal mudflats)	Less than significant (all habitats)
		USFWS Critical Habitat	Less than significant	Less than significant	Less than significant
		EFH	Less than significant	Less than significant	Not significant
	Long Term	Sensitive Riparian and Natural Vegetation Communities	Less than significant direct impact	Less than significant direct impact	Less than significant direct impact
		USFWS Critical Habitat	Less than significant	Less than significant	Less than significant
		EFH	Less than significant	Less than significant	Not significant
Jurisdictional Waters and Wetlands	Short Term		Less than significant direct impact	Less than significant direct impact	Less than significant direct impact
	Long Term		Less than significant	Less than significant	Less than significant
Sensitive Species	Short Term	Flora	Less than significant	Less than significant	No impact
		Fauna	Significant direct impact (Belding's) Less than significant direct impact (clapper rail) Significant indirect impact (construction noise)	Significant direct impact (Belding's) Less than significant direct impact (clapper rail) Significant indirect impact (construction noise)	Less than significant direct impact (Belding's, clapper rail, least tern, and snowy plover) Significant indirect impact (construction noise)
		Wildlife Corridors/Connectivity	Less than significant	Less than significant	Less than significant
	Long Term	Flora	Less than significant	Less than significant	Less than significant
		Fauna	Less than significant direct impact (Belding's and clapper rail) Less than significant indirect impact (transitional habitat)	Less than significant direct impact (Belding's and clapper rail) Less than significant indirect impact (transitional habitat)	No direct impact Less than significant indirect impact (transitional habitat)
		Wildlife Corridors/Connectivity	Less than significant	Less than significant	No impact
Local Ordinances, Policies, Adopted Plans	Short Term		No impact	No impact	No impact
	Long Term		No impact	No impact	No impact

short-term impacts to Belding's savannah sparrow remain significant and unavoidable with implementation of Alternative 2A and Alternative 1B.

Mitigation measures were considered to further reduce noise impacts, but were rejected as described below.

Electric dredge – The project currently proposes the use of a diesel dredge and/or an electric dredge. The potential benefit of requiring electric dredge use to reduce noise levels adjacent to habitats for sensitive bird species was evaluated. However, as described in Section 3.12, noise measurements from an electric dredge (estimated 71 dBA) and a diesel dredge (73 dBA) do not substantially differ. Therefore, the sole use of an electric dredge was not considered an effective mitigation measure for noise impacts to sensitive species (see Section 3.12 [Noise]).

Noise walls – In an upland environment, temporary noise walls are often required as mitigation, and constructed between the construction site and adjacent habitat. These walls are typically 6 feet high and constructed of plywood with strong footings to support the wall over the life of construction. This physical buffer can lower noise levels to below a level of significance. Because the dredge would be moving its way through the lagoon throughout construction, and the habitat of concern is directly adjacent marsh habitat, an intervening noise wall would have to be constructed in mucky conditions. The wall would be required along a substantial length of the lagoon on both north and south sides. Construction of the walls, with footings in a wet environment and strength for 2-year-long duration, would result in direct impacts to adjacent habitat that would otherwise not be touched, and could prevent/hinder marsh species from readily accessing the lagoon itself. The dredge would be mobile but the wall would not. The impacts associated with construction of the noise walls, and the introduced barrier, would reduce or eliminate the value of this mitigation measure. Noise walls are considered an infeasible mitigation measure.

Alternative work schedule (outside nesting season) – An alternative work schedule was considered requiring work to be conducted outside of the bird nesting season. This would avoid increased noise during the most sensitive time period for these marsh species as construction would completely halt February 15 through September 1. The stop and start schedule would extend the overall construction duration from 3 years to 6. The longer duration of construction would result in 4 contiguous years of disruption to foraging birds (including two sensitive resident birds—Belding's savannah sparrow and light-footed clapper rail, and two sensitive winter migrants—least tern and western snowy plover). This option was discussed with resource agency staff and lagoon managers in the SELRP

stakeholders group. They concurred that the longer duration would result in greater impacts than temporary construction noise during the breeding season, in part because the dredge is mobile. Furthermore, this measure would lengthen the amount of time the overall lagoon would need for habitat recovery by at least 2 years. A mitigation measure requiring work outside of the nesting season was determined to be biologically undesirable and therefore infeasible.

Materials Disposal

No significant impacts would occur, so no mitigation measures are proposed for impacts to biological resources associated with materials disposal.

3.6.5 LEVEL OF IMPACT AFTER MITIGATION

Lagoon Restoration

CEQA Conclusion: Short-term substantial adverse impacts to sensitive vegetation and Belding's savannah sparrow would be unavoidable with implementation of Alternative 2A and Alternative 1B. Noise impacts to nesting birds would be unavoidable with implementation of Alternative 2A, Alternative 1B, and Alternative 1A. As described above, even with the numerous project design features to reduce these impacts, they remain significant. No long-term significant impacts were identified for any of the project alternatives.

NEPA Conclusion: Short-term substantial adverse impacts to sensitive vegetation and Belding's savannah sparrow would be unavoidable with implementation of Alternative 2A and Alternative 1B. Noise impacts to nesting birds would be unavoidable with implementation of Alternative 2A, Alternative 1B, and Alternative 1A. As described above, even with the numerous project design features to reduce these impacts, they remain substantially adverse. As described above, although the restoration alternatives would have short-term impacts, the long-term ecological benefits would be substantial relative to the No Project/No Federal Action Alternative. No long-term substantial adverse impacts were identified for any of the project alternatives.

Materials Disposal

CEQA: No significant impacts would result to biological resources from materials disposal; therefore, no mitigation measures are proposed.

NEPA: No substantial adverse impacts to biological resources would result from materials disposal; therefore, no mitigation measures are proposed.